GROWTH, PRODUCTIVITY AND EMPLOYMENT IN THE MANUFACTURING SECTOR

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GOVERNMENT OF ONTARIO

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INTRODUCTION

During the period 1949 to 1959, Canada's Gross Domestic Product at Factor Cost in constant dollars expanded at a compound annual trend rate (calculated by least squares of logarithms) of 4.2 per cent. In this interval Canada's manufacturing volume of output rose at a compound annual rate of 4.0 per cent, manufacturing productivity (defined as output volume per manhour of work) increased at 3.3 per cent, and manufacturing employment at only 1.1 per cent.

During the same period, the compound annual trend rate for total paid workers in Canada was 3.2 per cent, and manufacturing employment declined from 23.2 per cent of Canada's civilian labour force in 1949 to 20.1 per cent in 1959.

The declining relative importance of manufacturing requirements for labour was combined with a change in the structure of manufacturing demand for labour. During the period, the compound annual trend rate of increase for labour in administrative and office positions was 3.5 per cent, but the rate for production workers was only 0.4 per cent.

Thus, there was a very slow rate of increase in output volume per administrative and office employee and a very high rate of rise in output volume per production worker. Manufacturing was becoming increasingly dependent upon increases in administrative and office employment and decreasingly dependent upon increases in the number of production workers. During this period, those who otherwise would have been employed as production workers in manufacturing were finding it necessary, owing to the change in the pattern of manufacturing demand for labour and the rise in productivity, to seek employment outside manufacturing.

During the period of fast economic growth from 1949 to 1956, the impact of the productivity and structural forces within manufacturing was obscured by the absorptive capacity of other sectors in the economy, such as

mining, construction, communications, utilities, trade, finance, insurance and real estate, government and services.

Thus, Canada was already experiencing what many economists forsee as a development from cybernation, but the fast rate of growth in the general non-agricultural economy provided a remedy.

When the economy slowed down considerably after 1956, manufacturing required less labour, and other sectors of the economy were not able to absorb the growth in the labour force.

The change in the pattern of demand for labour was shared by nearly all the industries in manufacturing, but the change was compounded by a structural shift in manufacturing output. The large and/or more traditional industries were becoming relatively less important while the smaller and/or newer industries, that tended to be more capital intensive and relatively more reliant upon administrative and office employees, were rising in importance.

The four per cent trend rate of expansion in the manufacturing sector could not have been achieved without the high rates of growth in these smaller and/or newer industries, such as tobacco and tobacco products, petroleum products, chemicals, electrical apparatus and supplies, and products for the new techniques of construction.

Although such industries were the major source of the aggregate rate of expansion in output, they also tended to show the largest rates of gain in productivity, and the result was that their rises in output were not reflected in employment figures.

Over the three subperiods in the decade under review, the rate of expansion in an increasing number of manufacturing industries decelerated, as weakness first appeared in agricultural implements, railway rolling stock, other wood products(1), and cotton and woollen textiles during the Korean War, then in the second period (1953 to 1956), spread to aircraft and parts, shipbuilding and repairing, motor vehicle parts and accessories, and clothing, and finally, in the third period (1956 to 1959), appeared in motor vehicles,

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(1) That is, other than furniture and saw and planing mills.

machinery manufacturing, bridge building and structural steel, hardware and tools, electrical apparatus and supplies, knitting mills, and the export-oriented saw and planing mills and non-ferrous metal smelting and refining industries.

These were the largest[1] contributors to output and employment in the manufacturing sector, and their successive entries into periods of decline reverberated through the economy, compounding the impact of rising productivity and the changing pattern of demand for labour in manufacturing, as well as the deceleration in various demand sectors of the economy.

(1) Aside from foods and beverages

CHAPTER I

THE SOURCES OF DECELERATION AFTER THE KOREAN WAR

In this chapter will be found three tables showing the compound annual rates of change for the aggregates and components of Gross National Expenditure, Gross Domestic Product and Manufacturing, in real terms, from peak to peak over the business cycle.(1)

Gross National Expenditure

Table 1 concerns the components of Gross National Expenditure in constant (1957) dollars. The GNE rose by 5.9 per cent per annum compounded over the first cycle (second quarter 1950 to fourth quarter 1953), by a slower rate of 5.2 per cent over the second cycle (fourth quarter 1953 to fourth quarter 1956) and by a much slower rate of 2.3 per cent over the third cycle (fourth quarter 1956 to first quarter 1960).

In the first cycle, the dominant role was played by government expenditures for goods and services. Far behind, in second place, was non-residential construction, followed by consumer durables and machinery and equipment.

In the second cycle, the rate of increase for government declined by 79 per cent, and the dominant role was played by non-residential construction (led by development of natural resources and transportation facilities), followed by machinery and equipment and consumer durables. The acceleration in these investment sectors raised the rate of growth for imports(2) from 6.7 per cent per annum compounded in the first cycle to 10.6 per cent in the second cycle, with an assist from growing consumer expenditures in travel abroad and import requirements for the accelerated motor vehicle industry. It will be noted that exports actually accelerated during the second cycle to a fairly high rate of 4.8 per cent compounded annually, but this satisfactory development was outweighed by the rise in imports, mainly for the investment sector but also for consumer expenditures. Thus, although this expansion was

(1) The first cycle is the Korean War cycle and is therefore dated from the second quarter of 1950, immediately prior to the war.
(2) One of the important components of these imports was the payment of interest and dividends to foreign investors.

led by business investment, the rate of national growth decelerated, owing to the high import content of this form of prosperity.

Table 1

COMPOUND ANNUAL RATES OF CHANGE PEAK-TO-PEAK OF BUSINESS CYCLE FOR COMPONENTS OF GROSS NATIONAL EXPENDITURE IN CONSTANT DOLLARS

	2Q1950 to 4Q1953	4Q1953 to 4Q1956	4Q1956 to 1Q1960
Personal expenditures for consumer goods and services	4.6	5.4	3.6
Durable goods	7.4	7.3	0.8
Non-durable goods	4.1	5.2	3.5
Services	4.8	5.2	4.7
Government expenditures for goods and services	14.6	3.1	2.1
Business gross fixed capital formation	6.5	9.3	-3.3
New residential construction	4.5	3.1	0.3
New plant and equipment	7.2	11.1	-3.9
New non-residential construction	8.8	14.1	-4.4
Machinery and equipment	5.9	8.5	-3.4
Exports of goods and services	4.2	4.8	3.7
Imports of goods and services	6.7	10.6	0.4
Gross National Expenditure	5.9	5.2	2.3
Gross Business Domestic Investment	8.0	11.3	-4.2
Final Domestic Demand	6.6	5.8	1.9
Total Final Purchases	6.2	5.7	2.2
G.N.P. implicit price index	5.1	2.7	2.0

In the third cycle, exports continued at a fairly high rate, but growth in imports virtually expired owing to the collapse in business investment and consumer durables. The absolute decline in business investment and the marked reduction in the expansion of consumer durables was accompanied by another reduction, of 32 per cent, in the rate of increase for government expenditures for goods and services, with the result that Gross National Expenditure decelerated from 5.2 per cent annually compounded in the second cycle to 2.3 per cent in the third cycle.

Real Gross Domestic Product at Factor Cost(1)

Table 2 shows the compound annual rate of change over the three cycles for the Real Gross Domestic Product at Factor Cost and its components.

The successive compound annual rates for Real Gross Domestic Product were 5.7 per cent, 5.9 per cent, and 1.9 per cent. Thus, GDP accelerated in the second cycle, contrary to the deceleration for Gross National Expenditure (from 5.9 per cent to 5.2 per cent). The reason for this contrast was the strong rise in the payment of interest and dividends to foreign investors. The amount required for these payments is produced in Canada and is therefore included in domestic product, but is earned by the foreign investors and is therefore excluded from national income, national product and, consequently, total national expenditure, since it is properly entered into the accounts as an import.

Comparison of the first two cycles shows that agriculture, storage and public administration and defence decelerated markedly in the second cycle and fishing and trapping declined absolutely. All the remaining sectors accelerated, and some of them by a very considerable margin.

The very high rate of growth (of 5.9 per cent annually compounded) from the peak of the Korean War cycle to the peak of the business investment cycle was accompanied by a high rate of increase (10.6 per cent annually compounded) in Canada's imports, as is traditional in a Canadian business investment boom.

It is particularly noteworthy that manufacturing accelerated by even more than the aggregate domestic economy from the first to the second cycle, particularly in non-durables, although durables also accelerated. Particularly high rates of expansion were achieved in mining, construction, electric power and gas utilities, transportation, communication, storage and domestic trade, as well as durable manufacturing.

(1) This section has been added since the rest of the report was completed in 1962.

Table 2

COMPOUND ANNUAL RATES OF CHANGE PEAK-TO-PEAK OVER BUSINESS CYCLE FOR INDEXES OF REAL DOMESTIC PRODUCT

	2Q1950 to 4Q1953	4Q1953 to 4Q1956	4Q1956 to 1Q1960
Gross Domestic Product	5.7	5.9	1.9
Goods-producing industries	6.3	6.4	1.0
Service-producing industries	4.9	5.5	3.0
Gross Domestic Product less agriculture	5.3	6.5	2.4
Goods-producing industries less agriculture	5.7	7.5	1.7
Commercial industries	5.4	6.3	1.7
Commercial less agriculture	5.0	6.9	2.2
Non-commercial industries	7.9	3.3	3.8
Index of industrial production	5.8	7.7	2.4
Agriculture	9.0	1.9	-2.4
Forestry	2.1	4.8	0.4
Fishing and trapping	3.9	-2.0	-5.2
Mining	7.8	16.5	5.1
Metals	0.4	12.9	11.0
Non-metals	2.6	6.3	1.7
Manufacturing	5.4	5.9	1.1
Non-durables	4.0	5.3	2.9
Durables	6.7	6.8	-0.8
Construction	6.5	8.7	-0.3
Electric power and gas utilities	9.3	12.2	10.2
Transportation	3.3	9.2	1.4
Storage	20.4	7.1	1.3
Communications	5.9	8.4	6.2
Wholesale trade	5.8	7.0	3.3
Retail trade	3.2	6.0	1.4
Finance, insurance and real estate	4.9	4.9	4.6
Public administration and defence	10.4	2.8	2.7
Community, recreation, business and personal service	3.6	4.0	3.6

Over the third cycle, however, there were very marked decelerations and declines in almost all sectors of the economy, although there were high rates of expansion in metallic mining (uranium), electric power and gas

utilities and communications. The declines were particularly significant in construction, agriculture and durables manufacturing.

It will be noted that although government expenditures for goods and services decelerated, from 3.1 per cent annually compounded in the second cycle, to 2.1 per cent in the third, the deceleration for public administration and defence was only from 2.8 per cent to 2.7 per cent. The source of the discrepancy is that the latter only includes actual output and therefore excludes purchases from business, which purchases are included in government expenditure for goods and services. In other words, it was business sales to government that bore the brunt of the deceleration in government expenditures.

In summary, although domestic production accelerated in the second cycle, national production declined, the discrepancy resulting from the enlarged payments of interest and dividends to foreign investors, and the severe deceleration in the third quarter resulted from the decline in government purchases from business as well as in business investment and consumer durables.(1)

Volume of Real Output in Manufacturing

Table 3 shows that real volume of output in manufacturing accelerated from 5.4 per cent annually compounded over the Korean War cycle, to 5.9 per cent from the peak of the Korean War cycle to the peak of the business investment cycle, and then decelerated to 1.1 per cent from the peak of the business investment cycle to the peak of the slow-growth cycle.

Of particular significance during the second cycle were the acceleration in iron and steel products (owing to non-residential construction, machinery and equipment and motor vehicles), non-metallic mineral products (owing particularly to construction), non-ferrous metal products and wood products (owing to accelerated exports mainly), products of petroleum and coal (displacement of imports), textiles (owing to the shift from natural

(1) See the author's recent (September 11, 1964) speech on the Forces Moulding the Economic Prospects for a general explanation of the onset of slow growth after 1956.

fibres, dependent on imports, to man-made fibres), rubber products, (mainly tires but also some new products), and even clothing.

In the third cycle all sectors were hit hard except foods and beverages and chemicals and allied products, both of which accelerated, and tobacco and tobacco products, which despite deceleration nevertheless had a high growth rate.

The industrial groups that bore the brunt of the deceleration in the economy were transportation equipment, clothing, electrical apparatus and supplies, iron and steel products and leather products, all of which contracted output over the cycle.

Table 3

COMPOUND ANNUAL RATES OF CHANGE PEAK-TO-PEAK OVER BUSINESS CYCLE FOR INDEXES OF REAL DOMESTIC PRODUCT IN MANUFACTURING SECTOR

	2Q1950 to 4Q1953	4Q1953 to 4Q1956	4Q1956 to 1Q1960
Total manufacturing	5.4	5.9	1.1
Non-durable manufacturing	4.0	5.3	2.9
Foods and beverages	3.7	3.7	3.8
Tobacco and tobacco products	4.5	8.2	5.1
Rubber products	4.6	7.5	0.0
Leather products	2.7	5.4	-0.4
Textiles	-3.3	7.8	1.9
Clothing	2.3	2.7	-1.9
Paper products	3.5	3.6	-2.1
Printing, publishing, etc.	4.5	6.2	1.8
Products of petroleum and coal	10.8	12.6	3.6
Chemicals and allied products	9.9	6.2	7.2
Durable manufacturing	6.7	6.8	-0.8
Wood products	3.4	4.9	1.1
Iron and steel products	3.8	10.4	-0.4
Transportation equipment	12.8	3.2	-5.7
Non-ferrous metal products	4.1	5.4	2.3
Electrical apparatus and supplies	10.6	7.3	-0.5
Non-metallic mineral products	8.3	10.3	3.9

CHAPTER II

THE CHANGING STRUCTURE OF THE MANUFACTURING ECONOMY

The forces that impinged on the manufacturing economy during 1949-1959, reduced the relative importance of Canada's well-established traditional industries and developed the more recent industries into stronger participants in the economy. In 1949 the eight largest industrial groups contributed 74.2 per cent of total manufacturing output volume, but over the succeeding decade each declined relatively, and their aggregate contribution was reduced to 68.3 per cent. During this period two of the smaller industrial groups, that however were traditional suppliers, also declined in relative importance, from 6.5 per cent to 5.9 per cent. Thus, the output volume of the ten combined traditional groups was reduced from 80.7 per cent of total output to 74.3 per cent, while the seven newer industrial groups increased their share from 19.3 per cent to 25.7 per cent.

Table 4

THE CHANGE IN THE STRUCTURE OF THE MANUFACTURING SECTOR

	Proportion of Total Manufacturing Output Volume		
	1949	1959	% Change in Proportion
Larger Industrial Groups			
1) Iron and Steel Products	14.7	14.5	- 1.9
2) Foods and Beverages	14.0	13.8	- 1.3
3) Transportation Equipment	9.7	8.5	-12.3
4) Paper Products	9.7	9.4	- 2.7
5) Wood Products	7.7	7.0	- 8.9
6) Clothing	6.6	5.0	-24.6
Average-Size Industrial Groups			
7) Textiles	5.9	4.9	-17.1
8) Non-ferrous Metal Products	5.9	5.3	-10.2
Smaller Industrial Groups			
A) More Traditional Groups			
9) Printing, Publishing and Allied Industries	4.7	4.5	- 4.5
10) Leather Products	1.9	1.5	-19.8
B) Newer Industrial Groups			
11) Electrical Apparatus & Supplies	5.2	6.4	23.2
12) Chemicals & Allied Products	5.0	6.9	38.9
13) Non-metallic Mineral Products	2.9	4.3	48.8
14) Miscellaneous Mfg. Industries	1.9	2.3	22.2
15) Products of Petroleum & Coal	1.9	3.0	61.0
16) Rubber Products	1.6	1.7	7.4
17) Tobacco and Tobacco Products	0.9	1.1	19.9

Among the thirty-two industries that contributed over 62 per cent of the total volume of manufacturing in 1949 and, owing to their importance, have been selected for the productivity analysis, eleven increased their proportions of total manufacturing output by 1959.

Table 5

GROUPS AND KEY INDUSTRIES THAT EXPANDED THEIR PROPORTIONS OF TOTAL MANUFACTURING VOLUME OF OUTPUT IN CANADA FROM 1949 TO 1959

	Proportion of Total Output		
	% Change in Proportion	1949	1959
Groups			
Products of Petroleum & Coal	61.0	1.9	3.0
Non-metallic Mineral Products (Durable)(1)	48.8	2.9	4.3
Chemicals and Allied Products(2)	38.9	5.0	6.9
Electrical Apparatus & Supplies (Durable)	23.2	5.2	6.4
Miscellaneous Manufacturing Industries	22.2	1.9	2.3
Tobacco and Tobacco Products	19.9	0.9	1.1
Rubber Products	7.4	1.6	1.7
Total Proportions	30.7	19.3	25.3
Key Industries			
Aircraft & Parts (Durable)	66.3	0.7	1.2
Glass & Glass Products (Durable)(1)	28.7	0.5	0.6
Medicinal & Pharmaceutical Preparations(2)	25.4	0.8	1.0
Synthetic Textiles & Silk	20.7	1.6	1.9
Domestic Clay Products (Durable)(1)	13.2	0.3	0.3
Bridge Building and Structural Steel (Durable)	13.0	0.8	0.9
Meat Products	12.1	1.9	2.1
Primary Iron & Steel (Durable)	11.8	3.1	3.5
Prepared Fruits and Vegetables	11.2	0.9	1.0
Other Paper Products	7.9	2.0	2.1
Iron Castings (Durable)	5.0	1.4	1.5
Total Proportions	15.9	14.0	16.2

(1) Non-metallic Mineral Products includes Glass and Glass Products and Domestic Clay Products.
(2) Chemicals and Allied Products includes Medicinal and Pharmaceutical Preparations.

Aside from Meat Products, all the groups and industries in the above table are classified as secondary manufacturing, and all of them are oriented to the domestic rather than the export market. Three major factors are mainly responsible for their growing relative position: 1) the displacement of imported products, 2) the introduction of new products, and 3) the rapid growth of the construction industry. A fourth factor that applied particularly to the Aircraft and Parts Industry was the high level of military procurement during and following the Korean War.

The displacement of imported products played the dominant role in the expansion of the Primary Iron and Steel and the Iron Castings industries, as well as the Tobacco and Tobacco Products, the Rubber Products and the Products of Petroleum and Coal groups.

The introduction of new products combined with the displacement of imports to induce dynamic expansion in the Electrical Apparatus and Supplies, the Chemicals and Allied Products (which includes the Medicinal and Pharmaceutical Preparations industry) and the Miscellaneous Manufactures groups.

The introduction of new products was the source of the extraordinary strength in the Meat Products, the Prepared Fruits and Vegetables, the Other Paper Products, and the Synthetic Textiles and Silks industries.

The expanding construction industry provided the impetus for the Non-metallic Mineral Products group, which includes the Glass and Glass Products and the Domestic Clay Products industries.

The manufacturing groups and industries that declined in relative importance in terms of output volume, as has been noted, had been long-established, utilized traditional materials, were export-oriented, served the agricultural sector, or supplied a sector which was converting to new materials or a sector in which capital efficiency was rising strongly. The largest decline in relative importance occurred in the manufacturing of Agricultural Equipment, the favourite of those who argue for freer trade and special manufacturing arrangements between Canada and the United States. The second largest relative decline was in Railroad and Rolling Stock Equipment, which

was affected by the dieselization, automating and rationalizing in the railroad transport industry.

The mainly export-oriented industries in relative decline included Saw and Planing Mills, Pulp and Paper, and Non-ferrous Metal Smelting and Refining.

Long-established industries using traditional materials were such textiles as Woollen Goods and Cotton Goods, the Clothing industries such as Knitting Mills and Men's, Women's and Children's Clothing, as well as Leather Boots and Shoes, Bread and Other Bakery Products, Furniture, and Printing, Publishing and Allied industries. These industries were largely dependent on the domestic consumer market, and high rates of family formation, births and immigration could not provide them with sufficient markets to enable them to sustain their positions in the economy.

Table 6

THE GROUPS AND KEY INDUSTRIES WITH DECLINING PROPORTIONS OF TOTAL MANUFACTURING VOLUME, CANADA, 1949 AND 1959

	Proportion of Manufacturing Output Volume		
	% Change in Proportion	1949	1959
Groups			
Clothing	-24.6	6.6	5.0
Leather Products	-19.8	1.9	1.5
Textiles	-17.1	5.9	4.9
Transportation Equipment	-12.3	9.7	8.5
Non-ferrous Metal Products	-10.2	5.9	5.3
Wood Products	- 8.9	7.7	7.0
Printing, Publishing and Allied Industries	- 4.5	4.7	4.5
Paper Products	- 2.7	9.7	9.4
Iron and Steel Products	- 1.9	14.7	14.5
Foods and Beverages	- 1.3	14.0	13.8
Total Proportions	- 8.0	80.7	74.3
Key Industries			
Agricultural Equipment	-60.7	1.7	0.7
Railroad & Rolling Stock Equipment	-59.0	2.3	0.9
Woollen Goods	-43.5	1.1	0.6
Other Wood Products	-41.9	0.7	0.4
Cotton Goods	-37.2	1.9	1.2
Men's, Women's & Children's Clothing	-26.7	4.1	3.0
Knitting Mills	-22.2	1.4	1.1
Brass and Copper Products	-20.5	0.9	0.7
Aluminum Products	-15.6	0.5	0.4
Hardware, Tools and Cutlery	-13.5	1.0	0.8
Leather Boots and Shoes	-12.2	1.1	1.0
Motor Vehicle Parts and Accessories	-11.4	1.7	1.5
Machinery Manufacturing	- 9.4	3.1	2.8
Saw and Planing Mills	- 6.3	5.3	4.9
Pulp and Paper	- 5.5	7.7	7.3
Shipbuilding and Repairing	- 3.5	1.0	0.9
Bread and Other Bakery Products	- 3.1	1.5	1.5
Non-ferrous Metal Smelting & Refining	- 2.9	3.8	3.7
Furniture	- 2.4	1.7	1.6
Motor Vehicles	- 0.8	3.8	3.8
Sheet Metal Products	- 0.3	1.3	1.3
Total Proportions	-16.6	48.1	40.1

Table 7

GROUPS AND KEY INDUSTRIES: PROPORTION OF TOTAL VOLUME OF OUTPUT IN MANUFACTURING IN CANADA, 1949 AND 1959

	Proportion of Total Output		
	1949	1959	% Change in Proportion
Groups			
Iron and Steel Products	14.7	14.5	- 1.9
Foods and Beverages	14.0	13.8	- 1.3
Transportation Equipment	9.7	8.5	-12.3
Paper Products	9.7	9.4	- 2.7
Wood Products	7.7	7.0	- 8.9
Clothing	6.6	5.0	-24.6
Textiles	5.9	4.9	-17.1
Non-ferrous Metal Products	5.9	5.3	-10.2
Electrical Apparatus and Supplies	5.2	6.4	23.2
Chemicals and Allied Products	5.0	6.9	38.9
Printing, Publishing and Allied Industries	4.7	4.5	- 4.5
Non-metallic Mineral Products	2.9	4.3	48.8
Miscellaneous Manufacturing Industries	1.9	2.3	22.2
Products of Petroleum and Coal	1.9	3.0	61.0
Leather Products	1.9	1.5	-19.8
Rubber Products	1.6	1.7	7.4
Tobacco and Tobacco Products	0.9	1.1	19.9
Key Industries			
Pulp and Paper	7.7	7.3	- 5.5
Saw and Planing Mills	5.3	4.9	- 6.3
Men's, Women's and Children's Clothing	4.1	3.0	-26.7
Motor Vehicles	3.8	3.8	- 0.8
Non-ferrous Metal Smelting and Refining	3.8	3.7	- 2.9
Machinery Manufacturing	3.1	2.8	11.8
Primary Iron and Steel	3.1	3.5	- 9.4
Railroad and Rolling Stock Equipment	2.3	0.9	-59.0
Other Paper Products	2.0	2.1	7.9
Meat Products	1.9	2.1	12.1
Cotton Goods (excl. clothing)	1.9	1.2	-37.2
Motor Vehicle Parts and Accessories	1.7	1.5	-11.4
Furniture	1.7	1.6	- 2.4
Agricultural Implements	1.7	0.7	-60.7
Synthetic Textiles and Silk	1.6	1.9	20.7
Bread and Other Bakery Products	1.5	1.5	- 3.1
Knitting Mills	1.4	1.1	-22.2
Iron Castings	1.4	1.5	5.0
Sheet Metal Products	1.3	1.3	- 0.3
Leather Boots and Shoes	1.1	1.0	-12.2
Woollen Goods (excl. clothing)	1.1	0.6	-43.5
Shipbuilding and Repairing	1.0	0.9	- 3.5
Hardware, Tools and Cutlery	1.0	0.8	-13.5
Prepared Fruits and Vegetables	0.9	1.0	11.2
Brass and Copper Products	0.9	0.7	-20.5
Medicinal and Pharmaceutical Preparations	0.8	1.0	25.4
Bridge Building and Structural Steel	0.8	0.8	13.0
Other Wood Products	0.7	0.4	-41.9
Aircraft and Parts	0.7	1.2	66.3
Aluminum Products	0.5	0.4	-15.6
Glass and Glass Products	0.5	0.6	28.7
Domestic Clay Products	0.3	0.3	13.2

CHAPTER III

THE ANNUAL TREND RATES IN VOLUME OF MANUFACTURING OUTPUT, 1949-1959

The changes in the structure of the manufacturing sector were the result of variations in rates of growth among the groups and industries. By examining the degree of these variations in annual trend rates over the ten year period, one may obtain a more accurate impression of the manner in which the various groups and industries have responded to the several forces that have been building up in the international and national economy. The trend rates will be supplemented by an examination of changes over the three intervals, 1949 to 1953, 1953 to 1956 and 1956 to 1959, in order to ascertain the periods during which important changes occurred in the various rates of production.

The groups and industries are classified in categories of leading, coincident or lagging (and, in some cases, declining) rates of growth in volume of output.

Groups and Key Industries with Leading Growth Rates

The leading growth rates were established by groups and key industries that were below average in scale of output volume. The highest rate, for example, was attained by the Aircraft and Parts industry, at 10.4 per cent per annum compounded,(1) but this industry contributed only 0.7 per cent of total manufacturing volume in 1949, compared to an average proportion among the 32 key industries of 1.9 per cent. The highest rate among the groups was achieved by Products of Petroleum and Coal, at 9.3 per cent annually, but the proportion was 1.9 per cent of all manufacturing in 1949, compared to an average 5.9 per cent among the 17 groups.

The five factors that induced these high rates of growth as mentioned previously were the displacement of imports, introduction of new materials or products, construction and defence procurement.

(1) All the rates in this chapter are derived from least squares of logarithms.

The table on the following page shows the annual trend rates for the leading groups and key industries and includes a list of important economic series. By comparing the industrial trends with those for the demand series one finds that the manufacture of products for construction (Non-metallic Mineral Products) increased at a slightly higher rate (8.5 per cent) than New Business Construction in Canada (8.4 per cent), and the Synthetic Textiles and Silk industry expanded at a rate (4.5 per cent) well above that for Consumer Expenditure on Clothing and Personal Furnishings (3.3 per cent). All the leading industries outpaced the increases for population, paid workers, Gross National Expenditure, Merchandise Exports, and Business Investment in New Machinery and Equipment.

Table 8

THE LEADING GROWTH GROUPS AND KEY INDUSTRIES IN MANUFACTURING, CANADA, 1949-1959

	Annaual Growth Rate 1949-1959	Proportion of Total Manufacturing Volume in 1949
Groups		
Products of Petroleum and Coal	9.3	1.9
Non-metallic Mineral Products (Durable)	8.5	2.9
Chemicals and Allied Products	7.6	5.0
Tobacco and Tobacco Products	6.9	0.9
Electrical Apparatus and Supplies (Durable)	6.7	5.2
Miscellaneous Manufacturing Industries	5.6	1.9
Key Industries		
Aircraft and Parts (Durable)	10.4	0.7
Medicinal and Pharmaceutical Preparations	7.6	0.8
Bridge Building and Structural Steel (Durable)	7.6	0.8
Glass and Glass Products (Durable)	6.5	0.5
Meat Products	5.2	1.9
Prepared Fruits and Vegetables	5.2	0.9
Domestic Clay Products (Durable)	5.0	0.3
Iron Castings (Durable)	5.0	1.4
Synthetic Textiles and Silk	4.5	1.6
Shipbuilding and Repairing (Durable)	4.5	1.0
Total Manufacturing	4.0	100.0

Note: For purposes of comparison, the following annual trend rates in important economic series during the period 1949-1959 may be considered:

Series	Annual Trend Rates
Population	2.7
Paid Workers	3.2
Series in Constant (1949) Dollars	
Gross National Expenditure	4.2
Total Consumer Goods	5.0
Consumer Durables	7.0
Consumer Non-Durables	4.6
Clothing and Personal Furnishings	3.3
New Business Construction (Residential and Non-residential)	8.4
New Business Machinery and Equipment	3.0
Physical Volume of Merchandise Exports	3.8

Groups and Key Industries with Coincident Rates of Growth

The two largest industrial groups, Foods and Beverages and Iron and Steel Products, expanded at coincident rates of growth, as one might expect of series that are basic to, and therefore tend to reflect the broad trend of, social and economic growth. These and the other groups and industries in this category advanced at rates between that for the number of paid workers (3.2 per cent) and that for the Gross National Expenditure (4.2 per cent). The one industry that is export-oriented in this category, Non-ferrous Metal Smelting and Refining, expanded output at a rate (3.9 per cent) slightly higher than that for the physical volume of merchandise exports.

Table 9

GROUPS AND KEY INDUSTRIES WITH COINCIDENT RATES OF GROWTH, CANADA, 1949-1959

	Annual Trend Rate of Growth	Proportion of Total Manufacturing, 1949
Groups		
Printing, Publishing and Allied Industries	4.0	4.7
Foods and Beverages	4.0	14.0
Rubber Products	3.8	1.6
Iron and Steel Products (Durable)	3.5	14.7
Key Industries		
Other Paper Products	4.3	2.3
Furniture (Durable)	4.0	1.7
Non-ferrous Metal Smelting and Refining (Durable)	3.9	3.8
Sheet Metal Products (Durable)	3.9	1.3
Bread and Other Bakery Products	3.7	1.5
Primary Iron and Steel (Durable)	3.7	3.1
Total Manufacturing	4.0	100.0
Total Durables Division	3.9	46.1
Total Non-durables Division	4.0	53.9

A glance at the table at the bottom of the page will reveal that all these groups and industries had trend rates considerably lower than those for construction and for consumer goods, but well above that for Business Investment in New Machinery and Equipment.

Note: For purposes of comparison, the following annual trend rates of important economic series during the period 1949-1959 may be considered:

		Series in Constant (1949) Dollars			
Population	2.7	Total Consumer Goods	5.0	New Business Construction (Res. & Non-Res.)	8.4
Paid Workers	3.2	Consumer Durables	7.0	New Business Machinery and Equipment	3.0
G.N.E. ($1949)	4.2	Consumer Non-durables	4.6	Physical Volume of Merchandise Exports	3.8
		Clothing and Personal Furnishings	3.3		

Groups and Key Industries with Lagging Rates of Growth

Lagging trend rates appeared in a wide assortment of groups and key industries. Six out of the seven groups in this category were larger than the average, in terms of the proportion of total manufacturing output volume, and five of the eleven key industries were larger than average.

The Paper Products group expanded at a higher rate (3.4 per cent) than the Pulp and Paper industry (3.1 per cent), reflecting the high rate of growth in the domestic paper forms and packaging industries as compared to the weakness in export markets. The lack of buoyancy in export markets also restrained the Saw and Planing Mills industry. Although the Machinery Manufacturing industry lagged, it nevertheless expanded at a higher rate (3.3 per cent) than new business investment in machinery and equipment (3.0 per cent), indicating a displacement of imports. The Leather Boots and Shoes industry increased output in proportion with the rate of rise in the number of paid workers in Canada (3.2 per cent), and Knitting Mills (2.6 per cent) nearly matched the rate of population growth (2.7 per cent), but the Men's, Women's and Children's Clothing industry lagged behind considerably, at an annual trend rate of 1.0 per cent compounded. The high trend rate for the Synthetic Textiles and Silk industry (4.5 per cent) was outweighed by declines in traditional textiles industries with the result that the Textiles group had the lowest rate of all seventeen groups in the manufacturing sector.

The Motor Vehicles industry tended to aim its output at a higher income group each year, thus reducing the size of their market, and requiring more parts that could be produced only in the United States, such as automatic transmissions, and this reduced the market for the Motor Vehicle Parts and Accessories industry by an even greater degree.

Table 10

GROUPS AND KEY INDUSTRIES WITH LAGGING RATES OF GROWTH, CANADA, 1949-1959

	Annual Trend Rate of Growth	Proportion of Total Manufacturing, 1949
Groups		
Paper Products	3.4	9.7
Wood Products (Durable)	2.9	7.7
Non-ferrous Metal Products (Durable)	2.8	5.9
Leather Products	2.6	1.9
Transportation Equipment (Durable)	2.5	9.7
Clothing	1.4	6.6
Textiles	1.3	5.9
Key Industries		
Machinery Manufacturing (Durable)	3.3	3.1
Leather Boots and Shoes	3.2	1.1
Pulp and Paper	3.1	7.7
Saw and Planing Mills (Durable)	2.9	5.3
Motor Vehicles (Durable)	2.9	3.8
Knitting Mills	2.6	1.4
Hardware, Tools and Cutlery (Durable)	1.4	1.0
Brass and Copper Products (Durable)	1.1	0.7
Men's, Women's & Children's Clothing	1.0	4.1
Aluminum Products (Durable)	0.8	0.5
Motor Vehicle Parts and Accessories (Durable)	0.4	1.7
Total Manufacturing	4.0	100.0

Note: For purposes of comparison, the following annual trend rates of important economic series during the period 1949-1959 may be considered:

		Series in Constant (1949) Dollars			
Population	2.7	Total Consumer Goods	5.0	New Business Construction (Res. & Non-Res.)	8.4
Paid Workers	3.2	Consumer Durables	7.0	New Business Machinery and Equipment	3.0
G.N.E. ($1949)	4.2	Consumer Non-durables	4.6	Physical Volume of Merchandise Exports	3.8
		Clothing and Personal Furnishings	3.3		

Key Industries with Declining Trend Rates in Volume of Output

Five key industries experienced declining trend rates in volume of output during the period 1949 to 1959. All were of considerable size and three were above the median size of the 32 key industries. The two non-durables industries, Cotton Goods and Woollen Goods (both excluding clothing), incurred competition from the Synthetic Textiles industry and also reflected the lagging rates of growth in the Clothing industries.

Among the three durables industries, the Other Wood Products industry (i.e., other than furniture and saw and planing mills) reflected the impact of substitute materials and of new methods of handling transported commodities. The Railfroad and Rolling Stock Equipment industry was hit by the revolution in the railroad transport industry.

Table 11

THE KEY MANUFACTURING INDUSTRIES WITH DECLINING TREND RATES IN VOLUME OF OUTPUT, CANADA, 1949-1959

	Annual Trend Rate of Output Volume	Proportion of Total Manufacturing, 1949
Other Wood Products (Durable)	-1.2	0.7
Cotton Goods (Excl. clothing)	-1.2	1.9
Woollen Goods (Excl. clothing)	-2.0	1.1
Railroad and Rolling Stock Equipment (Durable)	-3.2	2.3
Agricultural Implements (Durable)	-8.6	1.7
Total Manufacturing	4.0	100.0

CHAPTER IV

OUTPUT CHANGES OVER THREE INTERVALS DURING THE TREND PERIOD

Although it is vital to ascertain the various long-run trends of the different components in the manufacturing sector, understanding can be increased by examining the changes for each of the groups and key industries over intervals within the trend period. Within the trend period, there were three peaks of manufacturing activity, 1953, 1956 and 1959. The changes in production between 1949 and 1953, 1953 and 1956, and 1956 and 1959 have been computed and reduced to geometric annual averages in order to obtain figures that may be compared readily with the annual trend rates for the decade.

The Declining Industries

All five declining industries reduced volume of output from 1949 to 1953, the largest decline appearing in the Agricultural Implements industry. Contraction in the latter industry became even more severe during the second period, from 1953 to 1956 but thereafter, contrary to the general trend in manufacturing, this industry expanded output, achieving a geometric average annual compound rate from 1956 to 1959 of 10.5 per cent, as the industry adapted to the changes in the agricultural sector and began to compete with imports and in export markets. This rise was nearly ten times the increase in total manufacturing. Owing to the severity of the contractions in the earlier periods, however, output in 1959 remained considerably below the levels at the beginning of the period under review. In 1959, furthermore, 90 per cent of Canada's supply of farm machinery was imported, mainly from the United States, and 75 per cent of Canada's output was exported.

The Railroad and Rolling Stock Equipment industry succeeded in expanding its output in 1956 over that of 1953, but by 1959 it had declined at an average annual rate of 13.4 per cent from 1956. Although cycles have always been wide in this industry, it has also encountered a declining trend in demand for its product owing to the transformation in the railroad transport industry.

The third durables industry in this category, Other Wood Products (i.e., other than furniture and saw and planing mills), found itself with reduced output at each successive peak of the general business cycle. Unlike the railroad equipment industry, the major force impinging on this wood industry has been the substitution of competitive products made of different materials, and it is rather difficult for it to adapt by diversifying its operations.

The two non-durables industries in the declining category, Cotton Goods and Woollen Goods (excluding clothing) also obtained some benefit from the general upswing in the economy during 1955 and 1956, but not much, and the widespread stagnation thereafter induced contraction once more. These industries entered the 'fifties with the same industrial organization and capital stock they had in the 'twenties, but during the second half of the decade they entered a period of re-organization. Nevertheless, competition from synthetic materials continued, and this combined with the general lethargy in the economy, which induced a strong attitude of price consciousness among consumers, an attitude favourable to imports, maintained difficult circumstances for these industries.

The five industries in the declining category contributed 7.7 per cent of total manufacturing output in 1949, but by 1959 their proportion had declined to 3.8 per cent, despite the remarkable pick-up by the Agricultural Implements industry in the last period. It is obvious that these industries were a drag on the economy, in terms of both industrial and consumer requirements from other sectors of the economy, and from manufacturing in particular.

TABLE 12

INTERVAL OUTPUT CHANGES WITHIN THE TREND-RATE PERIOD FOR DECLINING INDUSTRIES

	Proportion of Total Manufacturing 1949	Annual Trend Rate 1949/1959	Geometric Average Annual Rates over Intervals 1953/1949	1956/1953	1959/1956
Other Wood Products (Durable)	0.7	- 1.2	-1.9	-0.9	-3.0
Cotton Goods (excluding clothing)	1.9	- 1.2	-0.7	1.4	-2.5
Woollen Goods (excluding clothing)	1.1	- 2.0	-2.8	1.2	-3.1
Railroad & Rolling Stock Equipment (Durable)	2.3	- 3.2	-0.5	4.3	-13.4
Agricultural Implements (Durable)	1.7	- 8.6	-10.0	-17.6	10.5
Total Manufacturing	100.0	4.0	6.0	4.7	1.1

The Lagging Groups and Industries

All eleven key industries in the lagging category increased output over the first period, and for four of them the gain was above the average in manufacturing. By 1956, however, three had declined from the level of 1953, four others had increased output by a lower average annual rate (1) than that over the first interval, and only two had gained more than the average in manufacturing. In 1959 all but three produced less than in 1956, and only two had risen by more than the average in manufacturing.

The Aluminum Products industry, which had been lifted by the steep rise in aircraft manufacturing during the Korean War, contracted output by 1956 almost as much as the aircraft industry. Research and development of new uses and products, however, lifted production in 1959 above the level of 1956 by an amount nearly four times the average for all manufacturing.

By 1953, the Motor Vehicles industry had raised production an annual average of 13.2 per cent over 1949; for the Motor Vehicle Parts and Accessories industry the average was 9.9 per cent. Both these are extraordinary figures, but the discrepancy between them is noteworthy. The Motor Vehicles industry expanded by considerably less over the next three years, and the parts industry declined. For both industries, output was lower in 1959 than 1956, but the average annual rate for Motor Vehicles was -7.4 per cent, while for parts it was -0.5 per cent.

Only two industries, Machinery Manufacturing and Pulp and Paper, increased output in 1956 by satisfactory amounts over 1953, but for these two this was the only period out of the three that they were above average. The gain for Machinery Manufacturing during the second period was a reflection of the capital investment boom, which faded thereafter. The Pulp and Paper industry caught' the surge in demand during the second period before world capacity became excessive.

In general, the pattern is one of below-average rates with the rises diminishing in size or being converted into declines. An exception was the Leather Boots and Shoes industry which expanded at rates considerably below average until 1959, when it increased its rate of gain, contrary to the general

(1) Geometric average annual compound rate of change over the period.

trend of manufacturing, and posted a gain three times the average, as the industry began to displace imports.

TABLE 13

INTERVAL OUTPUT CHANGES WITHIN THE TREND-RATE PERIOD FOR LAGGING GROUPS AND KEY INDUSTRIES

	Proportion of Total Manufacturing 1949	Annual Trend Rate 1949-1959	Geometric Average Annual Rates over Intervals 1953/1949	1956/1953	1959/1956
Groups					
Paper Products	9.7	3.4	4.3	5.3	1.9
Wood Products (Durable)	7.7	2.9	5.8	6.9	-1.1
Non-ferrous Metal Products (Durable)	5.9	2.8	4.7	3.5	0.4
Leather Products	1.9	2.6	1.6	2.8	1.3
Transportation Equipment (Durable)	9.7	2.5	13.4	-1.5	-6.3
Clothing	6.6	1.4	3.6	0.8	-1.3
Textiles	5.9	1.3	1.9	2.8	2.0
Key Industries					
Machinery Manufacturing (Durable)	3.1	3.3	2.8	9.0	-2.1
Leather Boots and Shoes	1.1	3.2	2.6	2.5	3.3
Pulp and Paper	7.7	3.1	4.1	5.4	1.1
Saw and Planing Mills (Durable)	5.3	2.9	6.7	3.5	-0.7
Motor Vehicles (Durable)	3.8	2.9	13.2	3.8	-7.4
Knitting Mills	1.4	2.6	3.3	4.1	-4.0
Hardware, Tools and Cutlery(Durable)	1.0	1.4	5.6	2.1	-0.7
Brass and Copper Products(Durable)	0.7	1.1	1.6	3.9	-
Men's, Women's and Children's Clothing	4.1	1.0	4.0	-0.8	-1.2
Aluminum Products (Durable)	0.5	0.8	7.6	-6.3	4.3
Motor Vehicle Parts & Accessories (Durable)	1.7	0.4	9.9	-2.6	-0.5
Total Manufacturing	100.0	4.0	6.0	4.7	1.1
Total Durables Division	46.1	3.9	7.5	4.7	-0.8
Total Non-durables Division	53.9	4.0	4.7	4.7	2.9

The Coincident Growth Industries

Although the rates of the various industries in the coincident category tended to follow the general pattern of diminishing gains over the three intervals, there were significant exceptions. The capital investment boom of 1955-56 raised the gains for the Sheet Metal Products and the Primary Iron and Steel industries for 1956 over 1953 markedly higher than those posted over the first period. Although their momentum declined over the third period the gains remained higher than the average for manufacturing, reflecting the filling-out of capacity and the resultant ability to displace imports.

The Printing, Publishing and Allied industries also achieved an exceptional gain in 1956 over 1953, with the introduction of a vast range of industrial publications, but thereafter production levelled out to a rate similar to that of manufacturing as a whole, as each publication found its place in the market.

The Other Paper Products industry (i.e., other than Pulp and Paper) made one of the highest rates of gain in manufacturing over the first period, then dropped to a level slightly above average, but this rate held virtually steady over the third period, instead of declining as did those of the other industries. Packaging, business forms and specialty item businesses were in a growth phase and sustained the pace for this industry.

The remaining three industries in this category reflected the general trend of diminishing gains. For the Smelting and Refining of Non-ferrous Metals the loss of impetus over the third period reflected the weakness in export markets. The rather considerable gains for the Bread and Other Bakery Products industry over the first two periods reflected rapid urbanization and the declining number of families consuming home-baked products. The decline in the rate over the third period reflected stabilization in these trends.

TABLE 14

INTERVAL OUTPUT CHANGES WITHIN THE TREND-RATE PERIOD FOR COINCIDENT GROWTH GROUPS AND KEY INDUSTRIES

	Proportion of Total Manufacturing 1949	Annual Trend Rate 1949-1959	Geometric Average Annual Rates over Intervals 1953/1949	1956/1953	1959/1956
Groups					
Printing, Publishing and Allied Industries	4.7	4.0	3.5	7.0	1.4
Foods and Beverages	14.0	4.0	4.1	4.4	3.6
Rubber Products	1.6	3.8	6.8	5.7	1.5
Iron and Steel Products (Durable)	14.7	3.5	3.6	8.0	0.4
Key Industries					
Other Paper Products	2.3	4.3	9.7	5.0	5.1
Furniture (Durable)	1.7	4.0	6.1	3.6	1.3
Non-ferrous Metal Smelting and Refining (Durable)	3.8	3.9	5.9	5.0	-
Sheet Metal Products (Durable)	1.3	3.9	3.4	6.3	3.0
Bread and Other Bakery Products	1.5	3.7	5.0	4.0	2.1
Primary Iron & Steel (Durable)	3.1	3.7	4.8	9.4	1.9
Total Manufacturing	100.0	4.0	6.0	4.7	1.1
Total Durables Division	46.1	3.9	7.5	4.7	-0.8
Total Non-durables Division		4.0	4.7	4.7	2.9

The Leading Growth Industries

Among the sixteen groups and key industries in the leading growth category, only four participated in the general pattern of declining rates over the three intervals. The three successive geometric average annual percentage rates for the Electrical Apparatus and Supplies groups were 10.8, 8.2 and -1.2. The introduction of mass-produced television receivers was accompanied by phenomenal market acceptance and sales expanded nearly vertically up the graphs. As the industry penetrated deeper into the market, the curve rounded and then declined, until the industry had achieved virtual saturation and had become dependent upon growth in the number of households and the replacement market. The industry introduced many other new products over the period, some original and some as import displacements, but the changes in the rate of activity over the period as a whole were governed mainly by the market for television receivers and by the trends in the general level of activity in the economy and military procurement.

In the Chemicals and Allied Products group the continual introduction of new uses, new products and import displacements is superimposed upon a large aggregation of established products that are required by nearly every industry and household and for which output responds to the changes in the general level of activity.

The Glass and Glass Products industry is dependent upon the residential and business construction industries (which have been incorporating more glass in their product) and upon other manufacturing industries such as motor vehicles and television receivers.

The Prepared Fruits and Vegetables industry has been sustained at a high level by urbanization and the displacement of home production but superimposed upon these forces are variations in the size and quality of the canning crop and in the rate of introduction of new products. These factors interacted strongly over the first and second period, but as the percentage increases in urbanization levelled and as the industry became increasingly quality conscious the interval rates of rise for Canadian output weakened. On the other hand, it must be stressed that the interval rate continually strengthened relative to the rate for manufacturing as a whole: for the first period it was 10 per cent higher, for the second 25 per cent and for the third nearly 200 per cent higher than rates for total manufacturing.

For one industrial group, Tobacco and Tobacco Products, the rates of rise increased over each interval, as a reflection of import displacement, market penetration and perhaps even heavier individual usage as urbanization continued.

Seven groups and industries achieved their highest rates of rise over the second period. For four of these this was the result of the capital investment boom in 1955-1956: Non-metallic Mineral Products, Domestic Clay Products, Bridge Building and Structural Steel, and Iron Castings. For the Medicinal and Pharmaceutical Preparations industry there was the introduction of new and import-displacing products. For the Meat Products industry there was the surge in live-stock supplies and the introduction of additional processing services. For the leading growth group, Products of Petroleum and Coal, there was displacement of imported petroleum products and market penetration for petroleum products in residential and business heating and railway fuel.

Two industries declined over both the second and the third intervals. Both had been expanded primarily by government procurement. The leading growth industry, Aircraft and Parts, increased output at a geometric average annual compound rate of 41.3 per cent from 1949 to 1953 in response to military orders placed during the Korean War and the Nato armament period. The subsequent declines reflected the reduction in military orders and the cancellation of the Avro Arrow contract in 1958.

A rate second only to that in the Aircraft industry was obtained by the Shipbuilding and Repairing industry over the first period owing to military orders for the Korean War and Nato armament and to government contracts for arctic-water vessles. The subsequent declines in government contracts could not be overcome by private contracts despite the building program for the Seaway Traffic.

The Synthetic Textiles and Silk industry advanced strongly over the second period, making inroads into markets for traditional textiles, experienced a slightly reduced rate of rise over the second period as the rate for motor vehicles declined (seat covers) and the industry began to incur technological and organizational problems, but in the third period it had solved these problems, had introduced new products, and had entered the export markets, and thereby achieved its highest rate over the third period.

TABLE 15

INTERVAL OUTPUT CHANGES WITHIN THE TREND-RATE PERIOD FOR THE LEADING GROWTH GROUPS AND KEY INDUSTRIES

Groups	Proportion of Total Manufacturing, 1949	Annual Trend Rate, 1949-1959	Geometric Average Annual Rates over Intervals		
			1953/49	1956/53	1959/56
Products of Petroleum and Coal	1.9	9.3	11.3	12.1	3.8
Non-metallic Mineral Products (Durable)	2.9	8.5	8.6	10.9	5.2
Chemicals and Allied Products	5.0	7.6	8.8	7.7	6.0
Tobacco and Tobacco Products	0.9	6.9	4.7	6.6	7.2
Electrical Apparatus and Supplies (Durable)	5.2	6.7	10.8	8.2	-1.2
Miscellaneous Mfg. Industries	1.9	5.6	9.0	1.4	7.6
Key Industries					
Aircraft and Parts (Durable)	0.7	10.4	41.3	- 8.4	-7.9
Medical and Pharmaceutical Preparations	0.8	7.6	4.9	9.4	5.9
Bridge Building and Structural Steel (Durable)	0.8	7.6	10.2	12.2	-7.1
Glass and Glass Products (Durable)	0.5	6.5	10.4	4.7	4.2
Meat Products	1.9	5.2	4.6	6.4	5.1
Prepared Fruits and Vegetables	0.9	5.2	6.6	5.7	3.1
Domestic Clay Products (Durable)	0.3	5.0	6.9	6.9	4.5
Iron Castings (Durable)	1.4	5.0	1.5	18.2	0.4
Synthetic Textiles and Silk	1.6	4.5	6.3	5.4	6.7
Shipbuilding and Repairing (Durable)	1.0	4.5	17.2	-7.5	-1.6
Total Manufacturing	100.0	4.0	6.0	4.7	1.1
Total Durables Division	46.1	3.9	7.5	4.7	-0.8
Total Non-durables Division	53.9	4.0	4.7	4.7	2.9

CHAPTER V

PRODUCTIVITY IN MANUFACTURING

For the purposes of this report productivity is defined as volume of output per manhour worked in the establishments classified in the various groups and industries. Increases in productivity in the groups and industries can be the result of many different circumstances. If there are two establishments in a given category and one has a higher productivity than the other, the combined productivity could be increased, even if there were no change in productivity in either establishment, merely as a result of faster expansion in the establishment with higher productivity, or even if there were contraction in the establishment with lower productivity. A significant proportion of the increase in productivity in the various groups and industries probably is the result of the relative decline in the importance of low productivity establishments. Even within an establishment, productivity for the plant as a whole may be increased as a result of relative decline in the importance of low productivity jobs, without these being an increase in productivity on any particular job. Despite the lack of specificity in productivity measurement, however, it is clear that even the productivity gains obtained by the rising relative importance of tasks or plants with higher productivity are an important economic phenomenon, for they mean that the axis of the economy is shifting towards more highly productive activities and allocations of factors of production.

In this review of the trends in productivity, the practice will be followed of classifying the groups and key industries into categories of leading, coincident, lagging and declining annual trend rates for productivity.

Industries with Declining Productivity

Three key manufacturing industries, all in the durables division, had declining annual trend rates for productivity from 1949 to 1959: Agricultural Implements, Aircraft and Parts, and Bridge Building and Structural Steel. Two had productivity considerably higher than the average in manufacturing in 1949 and for one productivity was relatively low in that year. Between 1949 and 1959, two had leading annual trend rates in growth and one had a declining trend rate of output.

Table 16

THE KEY INDUSTRIES WITH DECLINING ANNUAL TREND RATES FOR PRODUCTIVITY, 1949-1959

	Annual Trend Rate for Productivity	Percentage Deviation Above or Below Average Output Volume Per Manhour in Manufacturing		Annual Trend Rate for Volume of Output	Proportion of Total Manufacturing in 1949	
	1949-1959	1949	1959	1949-1959	Volume of Output	Employment
Bridge Building and Structural Steel (Durable)	- 0.3	27.0	-21.2	7.6	0.8	0.6
Aircraft and Parts (Durable)	- 0.6	-22.0	-43.7	10.4	0.7	0.9
Agricultural Implements (Durable)	- 3.4	18.9	-37.4	- 8.6	1.7	1.4
Total Manufacturing	3.3	-	-	4.0	100.0	100.0

The steepest declining trend in productivity occurred in the Agricultural Implements industry, which also contracted its volume of output. In 1949 productivity in this industry was nearly 19 per cent higher than the average for all manufacturing, but by 1959 it had declined to 37 per cent below the average. Owing to the contraction in output, the contribution of this industry to total manufacturing volume declined from 1.7 per cent to 0.7 per cent, and its proportion of manufacturing employment declined from 1.4 per cent to 1.0 per cent.(1)

(1) It will be noted, however, that the productivity trend declined at a considerably lower rate than that for volume of output.

Despite the fact that the Aircraft and Parts industry expanded output at an annual trend rate of 10.4 per cent, productivity declined at a trend rate of 0.6 per cent per annum, and output per manhour declined from 22 per cent below the average in manufacturing to 44 per cent below average. During this period the industry increased its proportion of manufacturing volume from 0.7 to 1.2 per cent and its proportion of manufacturing employment from 0.9 per cent to 2.2 per cent.

Rapid expansion in the Bridge Building and Structural Steel industry was also accompanied by a declining trend in productivity. Its proportion of total manufacturing volume was the same in 1959 as in 1949, but in employment the percentage rose from 0.6 to 1.1, and productivity declined from 27 per cent above the average in the earlier year to 21 per cent below the average in 1959.

Groups and Industries with Lagging Productivity

The twenty-three groups and key industries that had lagging trend rates of productivity gain over the decade comprised over 60 per cent of total manufacturing volume in 1949; they tended to be larger than average in size, and to have lagging, coincident or declining rates of growth, but they varied considerably in their relative degree of productivity at the beginning of the period, ranging from 46 per cent below the average to 115 per cent above the average productivity for all manufacturing in 1949.

Productivity lagged in the Iron and Steel Products group, which contributed 14.7 per cent of manufacturing volume in 1949, owing to the declining trend rates for productivity in Agricultural Implements and Bridge Building and Structural Steel, and to the lagging trend rates for Machinery Manufacturing, Sheet Metal Products, and Hardware, Tools and Cutlery. The productivity lag in this group is particularly significant, for the output of this group is basic to activity throughout the economy.

The Transportation Equipment group also contributed a large proportion of total manufacturing output, and its noticeably lagging productivity trend reflected the declining productivity trend in Aircraft and Parts as well as the lagging trends in Shipbuilding and Repairing, Railroad and Rolling Stock Equipment and Motor Vehicle Parts and Accessories. The latter industry, however, increased its productivity at a trend rate $2\frac{1}{2}$ times the rate for volume of output, and the Railroad and Rolling Stock Equipment industry had a rising productivity trend rate despite the declining trend in output.

The very low trend rates for productivity in Aluminum Products and Non-ferrous Metal Smelting and Refining as well as the lagging trend in Brass and Copper Products(1) resulted in a low productivity trend for the Non-ferrous group. In 1949, the Non-ferrous Metal Smelting and Refining industry had the highest productivity of all the groups and industries under review, at 115 per cent above the average, but by 1959 it had been far surpassed by Petroleum and Coal Products and nearly matched by Motor Vehicles as it declined to 72.5 per cent above average.

(1) Note that the productivity trend, however, was twice the rate for the trend in volume of output in Brass and Copper Products. (See table at end of this section.)

The low productivity trend in Non-ferrous Metal Smelting and Refining is significant in view of the fact that productivity lagged in the Pulp and Paper industry as well. These are among Canada's most important export industries, and the combined output of these two industries amounted to nearly 12 per cent of the total manufacturing volume in 1949. It will be noted also that productivity in the Pulp and Paper industry was 55 per cent higher than the average in manufacturing in 1949, but by 1959 the advantage had been reduced to 44 per cent.

The Clothing group contributed 6.6 per cent of total manufacturing volume in 1949, and the Men's, Women's and Children's Clothing industry 4.1 per cent. An important development for these industries was the fact that the trend rate in productivity was nearly double the trend rate of growth in output volume, owing to consolidation, the closing of low-productivity plants and the improved plant, machinery and equipment, organization and management in the remaining firms.

The important point about these groups and key industries with declining or lagging productivity trend rates is that in 1949 they contributed over 64 per cent of total manufacturing volume. Aside from Aircraft and Parts and Aluminum Products, they were long-established industries, and for some, their lag was no doubt due in some part to the continued utilization of outdated capital stock.

Table 17

GROUPS AND KEY INDUSTRIES WITH LAGGING ANNUAL TREND RATES FOR PRODUCTIVITY, 1949-1959

Groups	Annual Trend Rate for Productivity 1949-1959	Percentage Deviation Above or Below Average Output Volume Per Manhour in Manufacturing 1949	1959	Annual Trend Rate for Volume of Output 1949-1959	Proportion of Total Manufacturing in 1949: Volume of Output	Employment
Paper Products	2.5	36.5	29.3	3.4	9.7	6.5
Miscellaneous Manufacturing Industries	2.4	-16.4	-20.3	5.6	1.9	2.3
Clothing	2.4	-28.9	-37.4	1.4	6.6	10.1
Printing, Publishing and Allied Industries	2.3	- 8.2	-18.5	4.0	4.7	5.3
Iron and Steel Products (Durable)	1.9	21.4	- 3.2	3.5	14.7	14.0
Non-ferrous Metal Products (Durable)	1.9	49.1	32.4	2.8	5.9	3.8
Transportation Equipment (Durable)	1.7	6.2	- 2.3	2.5	9.7	8.9
Key Industries						
Meat Products	2.8	1.9	- 4.1	5.2	1.9	1.8
Bread and Other Bakery Products	2.6	-45.9	-48.7	3.7	1.5	2.7
Shipbuilding and Repairing (Durable)	2.6	-11.3	-16.2	4.5	1.0	1.1
Cotton Goods (excl. clothing)	2.6	-18.9	-21.6	- 1.2	1.9	2.3
Pulp and Paper	2.4	54.7	44.1	3.1	7.7	4.4
Brass and Copper Products (Durable)	2.3	10.1	0.5	1.1	0.9	0.8
Machinery Manufacturing (Durable)	2.2	- 0.6	-12.2	3.3	3.1	3.1
Sheet Metal Products (Durable)	2.1	- 6.3	-18.5	3.9	1.3	1.4
Railroad and Rolling Stock Equipment (Durable)	2.0	-21.4	-39.2	- 3.2	2.3	2.8
Men's, Women's and Children's Clothing	1.9	-21.6	-33.8	1.0	4.1	5.8
Furniture (Durable)	1.6	-27.0	-36.9	4.0	1.7	2.3
Other Wood Products (Durable)	1.0	-40.3	-52.3	- 1.2	0.7	1.2
Hardware, Tools and Cutlery (Durable)	1.0	- 9.4	-25.7	1.4	1.0	1.0
Motor Vehicles Parts and Accessories (Durable)	1.0	12.0	3.2	0.4	1.7	1.5
Non-ferrous Metal Smelting and Refining (Durable)	0.9	115.1	72.5	3.9	3.8	1.6
Aluminum Products (Durable)	0.2	- 5.0	-23.9	0.8	0.5	0.5
Total Manufacturing	3.3	-	-	4.0	100.0	100.0
Total Durables Division	2.9	3.0	- 0.9	3.9	46.1	44.3
Total Non-durables Division	3.7	- 3.0	0.9	4.0	53.9	55.7

Groups and Industries with Coincident Productivity Trend Rates

Aside from the Wood Products group, all the groups and key industries in the coincident productivity trend category were oriented to the domestic market and were secondary in nature. Half the industries had leading growth trend rates and half were above the average size of the key industries.

The rate for the Wood Products group reflects the high productivity rate in Saw and Planing Mills (See the following section) and the lagging productivity rates in the Furniture and the Other Wood Products industries. The coincident rate for the Foods and Beverages group reflects the leading rate for Prepared Fruits and Vegetables (See the following section) and the lagging rates for Meat Products and Bread and Other Bakery Products.

The productivity trend rates for the Leather Products group and the Leather Boots and Shoes industry were well above their growth rates; indicating that growth was combined with a considerable reduction in manhours.

For only two industries was productivity higher than the average for manufacturing in 1949 and 1959. In the Motor Vehicles industry, indeed, productivity was 70 per cent above the average, and the efforts to sustain this level are indicated by the fact that the trend rate for productivity was higher than that for volume of output during the decade.

Productivity in the Primary Iron and Steel industry was well above average in 1949, and although the trend rate during the decade was slightly below average, a considerable gain in 1959 lifted its margin by 50 per cent to nearly 28 per cent above the average.

Both the Domestic Clay Products and the Glass and Glass Products industries had annual trend rates of 3.7 per cent for productivity and leading growth rates for output volume. Although they are within the arbitrary category of coincident productivity rates, their rates were nevertheless 12 per cent above the average for all manufacturing.

Table 18

GROUPS AND KEY INDUSTRIES WITH COINCIDENT ANNUAL TREND RATES FOR PRODUCTIVITY, 1949-1959

Groups	Annual Trend Rate for Productivity 1949-1959	Percentage Deviation Above or Below Average Output Volume Per Manhour in Manufacturing 1949	1959	Annual Trend Rate for Volume of Output 1949-1959	Proportion of Total Manufacturing in 1949: Volume of Output	Employment
Leather Products	3.5	-25.8	-36.5	2.6	1.9	3.0
Wood Products (Durable)	3.2	-25.8	-27.9	2.9	7.7	10.4
Foods and Beverages	3.1	- 5.0	- 7.2	4.0	14.0	14.5
Key Industries						
Domestic Clay Products (Durable)	3.7	-15.7	- 9.0	5.0	0.3	0.3
Glass and Glass Products (Durable)	3.7	-12.6	-14.4	5.2	0.5	0.5
Leather Boots and Shoes	3.7	-38.4	-37.4	3.2	1.1	1.9
Primary Iron and Steel (Durable)	3.1	18.9	17.9	3.7	3.1	2.5
Motor Vehicles (Durable)	3.1	69.2	71.6	2.9	3.8	2.3
Other Paper Products	3.0	- 5.7	- 4.5	4.3	2.0	2.1
Total Manufacturing	3.3	-	-	4.0	100.0	100.0
Total Durables Division	2.9	3.0	- 0.9	3.9	46.1	44.3
Total Non-durables Division	3.7	- 3.0	0.9	4.0	53.9	55.7

Groups and Key Industries with Leading Productivity Trend Rates

The Groups and key industries in the leading category varied considerably in size and in deviation above and below average productivity, but most of them were small, had low productivity in 1949, had leading growth rates and were relatively new additions to the Canadian economy. Ten out of the fourteen groups and industries were in the non-durables manufacturing division.

Perhaps the most surprising feature is the appearance of the Textiles group, the Woollen Textiles industry and the Knitting Mills (clothing) industry in the leading productivity gain category. Two of these had lagging growth rates for output volume and the Woollen Goods industry had a declining trend rate for output. For all three, therefore, the rate for productivity was well above the rate of growth. Although productivity was below average in both 1949 and 1959, the margin had been reduced considerably. The Synthetic Textiles and Silk industry (the major source of growth and productivity for the Textiles group) not only had a leading growth rate but had an even higher productivity rate, indicating that the rapid increase in output was achieved despite a marked reduction in manhours. As a consequence productivity was lifted from 4.4 per cent above average in 1949 to 56.3 per cent above average in 1959. Since the Textiles groups contributed over five per cent of manufacturing output, the leading productivity rate was a significant factor in raising the average level of productivity in the economy.

The Tobacco and Tobacco Products group which achieved even higher rates of expansion through the period, also lifted its productivity rate above its growth rate, and in doing so raised its productivity from slightly below average in 1949 to 42 per cent above average in 1959.

The Chemicals and Allied Products group and the Medicinal and Pharmaceutical Preparations industry both had leading growth and productivity trend rates. The appearance of high productivity gains in a group that contributes over five per cent of manufacturing output volume was an important factor in raising the average level of productivity for the manufacturing sector.

The Rubber Products group also raised its productivity rate higher than its growth rate, lifting its productivity level from below to above the average in manufacturing.

Perhaps the most remarkable gains were made in the Products of Petroleum and Coal group. Nearly 85 per cent of the gain in output volume in this group was achieved by raising the level of productivity, and only 15 per cent required in increase in manhours. Owing to this superlative rise this group raised its productivity to 139 per cent above the average in manufacturing.

The Iron Castings industry also raised productivity faster than its leading growth rate, changing its productivity level from 15 per cent below average in 1949 to 22 per cent above average in 1959.

The Saw and Planing Mills industry, which is largely export-oriented, increased its productivity trend rate nearly 35 per cent faster than its growth rate, and its important role in the economy (providing five per cent of manufacturing output) meant that this accomplishment contributed significantly to the rise in the productivity of the total manufacturing sector.

A most satisfactory contribution was also made by the Electrical Apparatus and Supplies group, which had leading trend rates in both productivity and growth. As we have seen (in the section on the changing structure of the manufacturing sector) this group rose from 5.2 per cent of total manufacturing output in 1949 to 6.4 per cent in 1959; this fact combined with the high productivity rate was one of the most important sources of the rise in productivity for total manufacturing.

In the perspective of the preceding sections on structure and growth, this review of the trend rates for productivity in manufacturing indicates that productivity was the result mainly of the growth of relatively new capital-intensive industries, the introduction of new products and the convulsive reorganizations that occurred in the Saw and Planing Mills industries and in the Textiles and Clothing industries.

Although leading productivity rates tended to occur in industries with leading growth rates, there were leading growth industries with lagging productivity rates (Meat Products, Shipbuilding and Repairing and the Miscellaneous Manufacturing industries) and leading productivity industries with lagging or coincident growth rates (Rubber Products, Textiles, Woollen Goods excluding clothing, Knitting Mills, and Saw and Planing Mills). Thus, fast growth may be accompanied by low productivity rates, and productivity may rise markedly in rapidly or slowly expanding industries. Rising productivity is largely a function of the development of new materials, plant, management or skills. It does not necessarily result in growth for an industry: rising productivity in an industry may reflect the presence of profitable opportunities, even in a stable market, for the efficient survivors, and the discontinuation of operations by less efficient producers.

An example of what might appear to be anomalies in the relationship between growth and productivity is found in the clothing and textile industries. The clothing industry, which provides a major market for textiles, had a slow trend rate of output, but the synthetic textiles industries had a leading growth rate while the traditional woollen and cotton textiles declined owing to the squeeze between the lagging demand for textiles and rising competition from synthetic textiles. Yet, both synthetic textiles and woollen textiles achieved leading trend rates in productivity.

Table 19

GROUPS AND KEY INDUSTRIES WITH LEADING ANNUAL TREND RATES FOR PRODUCTIVITY, 1949-1959

Groups	Annual Trend Rate for Productivity 1949-1959	Percentage Deviation Above or Below Average Output Volume Per Manhour in Manufacturing 1949	1959	Annual Trend Rate for Volume of Output 1949-1959	Proportion of Total Manufacturing in 1949: Volume of Output	Employment
Products of Petroleum and Coal	7.9	55.3	138.7	9.3	1.9	1.2
Tobacco and Tobacco Products	7.5	- 1.9	41.9	6.9	0.9	0.9
Chemicals and Allied Products	5.3	40.3	67.6	7.6	5.0	3.5
Non-metallic Mineral Products (Durable)	4.4	13.8	23.4	8.5	2.9	2.4
Rubber Products	4.2	- 8.8	3.6	3.8	1.6	1.8
Textiles	4.0	-12.6	- 2.3	1.3	5.9	6.6
Electrical Apparatus and Supplies (Durable)	3.9	11.3	13.5	6.7	5.2	4.8
Key Industries						
Iron Castings (Durable)	7.1	-15.1	22.1	5.0	1.4	1.6
Medical and Pharmaceutical Preparations	7.0	27.0	64.9	7.6	0.8	0.7
Synthetic Textiles and Silk	6.8	4.4	56.3	4.5	1.6	1.4
Knitting Mills	5.0	-34.0	-30.6	2.6	1.4	2.3
Woollen Goods (Excluding Clothing)	4.7	-30.2	-23.4	- 2.0	1.1	1.5
Prepared Fruits and Vegetables	4.2	-23.9	-14.4	5.2	0.9	1.3
Saw and Planing Mills (Durable)	3.9	-22.6	-20.7	2.9	5.3	6.9
Total Manufacturing	3.3	-	-	4.0	100.0	100.0

CHAPTER VI

EMPLOYMENT TRENDS IN MANUFACTURING

Although the annual trend rate for output volume in manufacturing from 1949 to 1959 was 4.0 per cent, the high rate of gain in productivity, at 3.3 per cent, resulted in a low employment trend rate of 1.1 per cent per annum. In the durables division, the productivity rate was lower, at only 2.9 per cent, and employment increased at a rate of 1.4 per cent.(1) In the non-durables division, however, 92.5 per cent of the gain in volume of output was achieved by way of increasing productivity and only 7.5 per cent of the growth required an increase in the number of manhours; as a result while output rose at a trend rate of 4.0 per cent and productivity at 3.7 per cent, employment increased at only 0.8 per cent per annum.

In general, the higher rates of rise in employment occurred in the smaller groups and industries. Although there was a tendency for these higher employment rates to appear in the groups and industries with the leading growth rates, there were significant exceptions. For example, the Tobacco and Tobacco Products group expanded output at a trend rate of 6.9 per cent, and the Iron Castings industry at a rate of 5.0 per cent, yet both had declining annual trend rates for employment, and although the Pulp and Paper industry lagged in growth, with a rate of 3.1 per cent, it had a leading employment trend rate of 2.5 per cent per annum.

From the point of view of the problem of ascertaining the prospects of manufacturing employment, it is significant that the higher rates of growth and employment tended to occur in the smaller groups and industries, but it is also important to realize that the employment rates were a result of the relationships between the growth and productivity rates.

(1) The trend was for 74.4 per cent of the rise in output to be derived from increased productivity, compared with 82.5 per cent in manufacturing as a whole.

In nearly all groups and key industries, the annual trend rates for administrative and office employees rose faster than those for production workers, or rose while the rates for production workers declined, or declined more slowly than the rates for production workers. The difference between these trend rates is an indication of the changing nature of manufacturing. In addition to the growing relative burden of record-keeping, and of communication up and down the chain of command as well as horizontally among branches, departments, dispersed sites and offices and the "outside", there is an expanding relative need for specialists concerned with the many varied problems of research, development, operations and administration. One of the problems confronting the manufacturing industries is that of adjusting the trend rate for overhead employees to a more efficient relationship with the trend in production. The employment problem for the nation results from the relative decline in demand for production workers.

Groups and Industries with Lagging or Declining Employment Rates

Without exception the twenty groups and key industries with lagging or declining annual trend rates in employment increased productivity at a faster rate than output volume. Furthermore, all the groups and key industries that increased productivity faster than output had declining employment rates. The second sentence is not simply the obverse of the first, for it is conceivable that productivity exceed growth, yet that the rate of growth be sufficiently high to require an increase in employment, and it is important to note that this situation did not occur in any of the seventeen groups or thirty-two key industries under review.

In general, the groups and industries in the lagging or declining employment category reduced the number of production workers, but either reduced the number of administrative and office employees at a lower rate or even increased their number, but among the twenty there were three exceptions. In the Tobacco and Tobacco Products group, the trend rate for production workers was virtually nil, but for administrative and office employees there was a declining trend rate of -0.7 per cent per annum. In the Clothing group, the respective trend rates were -0.7 per cent and -1.5 per cent, and in the Men's, Women's and Children's Clothing industry the respective trend rates were -0.8 and -1.6 per cent per annum. These comparisons indicate a strong trend toward the operation of larger establishments, which provided economies of scale in the utilization of overhead employees. Although the Tobacco and Clothing industries had these employment trends in common, as well as the relationship between growth and productivity, an indication of the hazards involved in generalizing about manufacturing is the fact that otherwise their fortunes differed, for the Tobacco and Tobacco Products group had leading trend rates in growth and productivity while the Clothing group and industry lagged well behind in both these categories.

In several of the groups and industries in the lagging or declining employment rate category, the differences between the trend rate for production workers and those for administrative and office employees were striking. In the Motor Vehicles industry, for example, the annual trend rate for production workers was -0.8 per cent but for administrative and office employees the trend rate was 4.5 per cent per annum. For the Motor Vehicle Parts and Accessories industry the respective rates were -1.4 per cent and 4.3 per cent, and for Cotton Goods (excluding clothing) they were -4.7 per cent and 4.9 per cent. The high rates for administrative and office employees may be compared with the lagging growth rates for the Motor Vehicles Group and the Motor Vehicles Parts industries (2.9 per cent and 0.4 per cent, respectively) and with the declining output trend (-1.2 per cent) for the Cotton Goods industry.

One-half of the six groups and eight of the fourteen key industries in the lagging or declining employment category were above the respective medians(1) in proportions of total manufacturing employment, and all but one of the remaining key industries were at or near the median. In the eight groups and twelve key industries with leading annual trend rates for employment, on the other hand, only two groups and six industries were larger than the respective medians.

(1) For the 17 industrial groups the median proportion of all manufacturing employment was 4.8 per cent, and for the 32 key industries it was 1.5 per cent.

Table 20

GROUPS AND KEY INDUSTRIES WITH LAGGING OR DECLINING ANNUAL TREND RATES IN EMPLOYMENT, 1949-1959

	Proportion of Total Employees in Manufacturing, 1949 (1)	Annual Trend Rates, 1949-1959						
		Number of Employees			Productivity (2) re			
		Production Workers	Administration and Office	All Employees	Production Workers	Administration and Office	All Employees	Volume of Output
Groups with Declining Employment Rates								
Tobacco & Tobacco Products	0.9	0.01	- 0.7	- 0.1	7.4	7.7	7.5	6.9
Wood Products	10.4	- 0.2	0.3	- 0.1	3.2	3.1	3.2	2.9
Rubber Products	1.8	- 0.7	1.1	- 0.3	4.6	2.8	4.2	3.8
Clothing	10.0	- 0.7	- 1.5	- 0.8	2.3	3.3	2.4	1.4
Leather Products	3.0	- 1.1	- 0.7	- 1.0	3.5	3.8	3.5	2.6
Textiles	6.6	- 3.4	2.7	- 2.4	4.9	- 0.9	4.0	1.3
Key Industries								
A) Lagging Employment Trend								
Motor Vehicles	2.3	- 0.8	4.5	0.3	4.6	- 1.3	3.1	2.9
B) Declining Employment Trend								
Motor Vehicle Parts and Accessories	1.5	- 1.4	4.3	- 0.3	2.6	- 3.5	1.0	0.4
Leather Boots and Shoes	1.9	- 0.9	0.5	- 0.5	3.7	3.4	3.7	3.2
Brass and Copper Products	0.8	- 1.3	2.2	- 0.6	3.0	- 0.6	2.3	1.1
Saw and Planing Mills	6.9	- 0.7	- 0.7	- 0.7	3.8	4.1	3.9	2.9
Men's,Women's and Children's Clothing	5.8	- 0.8	- 1.6	- 0.9	1.7	3.0	1.9	1.0
Iron Castings	1.6	- 2.1	3.5	- 1.2	8.0	1.8	7.1	5.0
Other Wood Products	1.2	- 1.9	- 1.2	- 1.8	1.1	0.9	1.0	- 1.2
Synthetic Textiles and Silk	1.4	- 3.2	3.3	- 1.9	8.1	1.4	6.8	4.5
Knitting Mills	2.3	- 2.4	- 2.2	- 2.4	5.0	5.1	5.0	2.6
Cotton Goods (Excl. Clothing)	2.3	- 4.7	4.9	- 3.7	3.7	- 5.7	2.6	- 1.2
Railroad and Rolling Stock Equipment	2.8	- 5.2	2.2	- 4.5	2.8	- 4.4	2.0	- 3.2
Agricultural Implements	1.4	- 6.2	- 1.3	- 5.1	- 2.6	- 7.0	- 3.4	- 8.6
Woollen Goods (Excl. Clothing)	1.5	- 6.9	- 4.4	- 6.6	4.9	2.8	4.7	- 2.0
Total Manufacturing	100.0	0.4	3.5	1.1	3.9	0.6	3.3	4.0
Total Durables Division	44.3	0.5	4.8	1.4	3.7	- 0.5	2.9	3.9
Total Non-durables Division	55.7	0.3	2.5	0.8	4.1	2.0	3.7	4.0

(1) For the 17 industrial groups the median proportion of all manufacturing employment was 4.8 per cent, and for the 32 key industries it was 1.5 per cent in 1949.

(2) Volume of output per manhour.

The Groups and Key Industries with Coincident Employment Trend Rates

All three groups and two of the six key industries in the coincident employment rate category had proportions of manufacturing employment higher than the respective medians. The two largest and the fifth largest manufacturing groups were in this category. Foods and Beverages, the largest group (14.5 per cent of total manufacturing employment) increased total employment at a trend rate of 1.4 per cent, production workers 1.3 per cent and administrative and office employees 1.7 per cent. For the Bread and Other Bakery Products industry, the respective trend rates were 1.6, 1.0 and 1.5 per cent per annum. The rates for production workers in these two industrial categories, 1.3 per cent and 1.0 per cent, may be compared with the average for all manufacturing of 0.4 per cent, and the rates for overhead employees, 1.7 per cent and 1.5 per cent, respectively, may be compared with the rate of 3.5 per cent for all manufacturing. To round out the picture, the trend rate for the Foods and Beverages group output volume was identical with that of all manufacturing, 4.0 per cent, but for the Bread and Other Bakery Products industry the trend rate was lower, at 3.7 per cent. These comparisons imply that the group and the industry were both lagging the achievement of productivity gains in the production processes, but were maintaining a considerably lower ratio of overhead employees to volume of output than was general in manufacturing.

The Prepared Fruits and Vegetables industry, on the other hand, participated in the general trend in manufacturing by raising overhead employment considerably faster than production workers. Although this industry also had a leading trend rate for output volume, no cause and effect relationship should be inferred solely from these comparisons,for some other industries that participated in this trend(1) had lagging rates of growth, as only eleven of the twenty-three groups and industries that increased overhead employment at rates higher than the average had growth rates higher than the average.

(1) For example, the Non-ferrous Metal Products group had trend rates for production workers of 1.0 per cent and for overhead employees of 4.0 per cent, yet for output volume only 2.8 per cent, which was well below average.

The Iron and Steel Products group, for example, increased overhead employment at a trend rate nine times its rate for production workers, yet the output trend rate was below average (3.5 per cent compared with 4.0 per cent) and its productivity trend rate was 42 per cent below the average (1.9 per cent compared with 3.3 per cent). In the Hardware, Tools and Cutlery industry, the trend rate for overhead employees was nearly 16 times that for production workers, yet the growth rate was only 1.4 per cent and the productivity rate was only 1.0 per cent.

The Aluminum Products industry raised total employment at precisely the same trend rate as that of total manufacturing, at 1.1 per cent per annum, yet it reduced employment of production workers at a trend rate of -0.2 per cent, increased overhead employment at 3.6 per cent, and nevertheless obtained a growth rate of only 0.8 per cent and a productivity trend rate of only 0.2 per cent per annum.

On the other hand, the Medicinal and Pharmaceutical Preparations industry raised overhead employment at a trend rate nearly nine times that for production workers and achieved a leading growth rate of 7.6 per cent and a leading productivity rate of 7.0 per cent, with the result that total employment rose at a trend rate of only 0.8 per cent per annum, a rate roughly coincident with, although below, that for total manufacturing (1.1 per cent).

Table 21

GROUPS AND KEY INDUSTRIES WITH COINCIDENT ANNUAL TREND RATES IN EMPLOYMENT, 1949-1959

	Proportion of Total Employees in Manufacturing, 1949 (1)	Annual Trend Rates, 1949-1959						
		Number of Employees			Productivity (2) re			
		Production Workers	Administration and Office	All Employees	Production Workers	Administration and Office	All Employees	Volume of Output
Groups								
Foods and Beverages	14.5	1.3	1.7	1.4	3.4	2.6	3.1	4.0
Iron and Steel Products	14.0	0.5	4.5	1.3	2.7	- 0.7	1.9	3.5
Transportation Equipment	8.9	0.5	7.3	1.3	3.1	- 4.1	1.7	2.5
Key Industries								
Bread and Other Bakery Products	2.7	1.6	1.0	1.5	2.5	3.3	2.6	3.7
Primary Iron and Steel	2.5	0.5	5.4	1.3	3.9	- 2.0	3.1	3.7
Aluminum Products	0.5	- 0.2	3.6	1.1	1.4	- 2.5	0.2	0.8
Prepared Fruits and Vegetables	1.3	0.6	2.8	1.0	4.5	2.7	4.2	5.2
Hardware, Tools and Cutlery	1.0	0.2	3.1	0.8	1.7	- 1.6	1.0	1.4
Medicinal and Pharmaceutical Preparations	0.7	0.2	1.7	0.8	7.7	6.1	7.0	7.6
Total Manufacturing	100.0	0.4	3.5	1.1	3.9	0.6	3.3	4.0
Total Durables Division	44.3	0.5	4.8	1.4	3.7	- 0.5	2.9	3.9
Total Non-durables Division	55.7	0.3	2.5	0.8	4.1	2.0	3.7	4.0

(1) For the 17 industrial groups the median proportion of all manufacturing employees was 4.8 per cent, and for the 32 key industries it was 1.5 per cent in 1949.

(2) Volume of output per manhour.

The Groups and Key Industries with Leading Employment Rates

Only two of the eight groups and six of the twelve key industries in the leading employment trend rate category had proportions of total manufacturing employment higher than their respective medians. Five groups and seven industries had growth rates above the average growth trend rate in manufacturing. Only four groups and two industries had productivity rates above the average(1) productivity trend rate in manufacturing: these four groups and two industries had leading growth rates combined with their leading productivity rates and all were considerably smaller than their respective medians in proportions of total manufacturing employment. Thus, there was a tendency for the leading employment trend rates to occur in the smaller groups and industries, and in those with growth rates above average, and there was a marked tendency for leading employment rates to occur in groups and industries with productivity rates below average.

The highest employment trend rates appeared in Aircraft and Parts and in Bridge Building and Structural Steel, and although they had leading growth rates they had declining productivity rates.

Only one of the twenty groups and industries, Products of Petroleum and Coal, had a declining trend rate for production workers. However, the trend rate for overhead employees in this industry was sufficiently high to provide a leading rate for total employees. Although the group was a leader in raising employment, the rate, at 1.6 per cent, was far below its trend rate of growth, 9.3 per cent, owing to the high productivity trend rate of 7.9 per cent. This industrial group provides an excellent example of the impact of technology and automation on the pattern of demand for labour. Although it had the second highest growth rate among the 49 groups and key industries under review, the group was able to reduce its employment of production workers.

(1) In two cases, however, the productivity trend rates were within the range of coincident rates: Glass and Glass Products and Domestic Clay Products.

Only one group, Printing, Publishing and Allied Industries, and one industry, Meat Products, increased overhead employment at a trend rate below the average in manufacturing, (2.9 per cent in both cases compared with the average of 3.5 per cent). Although both had low productivity trend rates, the printing group also had a low growth rate while the Meat Products industry had a leading growth trend rate.

Two of the three major export-oriented industries appeared in this category of leading employment trend rates, Non-ferrous Metal Smelting and Refining and Pulp and Paper.(1) Both had lagging growth and productivity trend rates.

The construction-oriented group (Non-metallic Mineral Products) and industries (Glass and Glass Products and Domestic Clay Products) all had leading trend rates for growth and employment, while the Mineral Products group had a leading, and the Glass and Clay Products industries had coincident, trend rates for productivity (although the latter were, however, above average). In the Domestic Clay Products industry, however, the trend rate for overhead employees exceeded that for output.

The Electrical Apparatus and Supplies group had leading trend rates in all three categories, and the trend rate for overhead employees exceeded that for growth.

Although the Machinery Manufacturing industry had lagging trend rates for growth and productivity, growth led productivity by a margin sufficient to induce a leading employment trend rate. Overhead employment increased at a rate $8\frac{1}{2}$ times that for production workers, and considerably faster than the growth rate.

(1) The third, Saw and Planing Mills, had a declining trend rate for employment, and a leading productivity trend rate combined with a low growth rate.

Table 22

GROUPS AND KEY INDUSTRIES WITH LEADING
ANNUAL TREND RATES IN EMPLOYMENT, 1949-1959

	Proportion of Total Employees in Manufacturing, 1949 (1)	Annual Trend Rates, 1949-1959						
		Number of Employees			Productivity (2) re			
		Production Workers	Administration and Office	All Employees	Production Workers	Administration and Office	All Employees	Volume of Output
Groups								
Non-metallic Mineral Products (Durable)	2.4	3.9	7.1	4.5	5.0	1.6	4.4	8.5
Miscellaneous Manufacturing Industries	2.3	2.6	6.0	3.4	3.1	- 0.1	2.4	5.6
Chemicals and Allied Products	3.5	1.7	4.2	3.0	6.0	- 4.8	5.3	7.6
Electrical Apparatus and Supplies (Durable)	4.8	1.3	7.1	2.9	5.7	- 0.4	3.9	6.7
Paper Products	6.5	1.9	3.9	2.3	3.0	0.2	2.5	3.4
Printing, Publishing and Allied Industries	5.3	1.3	2.9	1.9	2.9	1.4	2.3	4.0
Non-ferrous Metal Products (Durable)	3.8	1.0	4.0	1.6	2.4	- 0.6	1.9	2.8
Products of Petroleum and Coal	1.2	- 0.2	5.3	1.6	9.6	4.1	7.9	9.3
Key Industries								
Aircraft and Parts (Durable)	0.9	10.7	14.8	12.1	0.7	- 3.3	- 0.6	10.4
Bridge Building and Structural Steel (Durable)	0.6	7.9	9.2	8.2	0.0	- 1.3	- 0.3	7.6
Non-Ferrous Metal Smelting and Refining (Durable)	1.6	3.6	6.8	4.1	1.5	- 1.7	0.9	3.9
Glass and Glass Products (Durable)	0.5	3.3	5.1	3.6	4.0	1.5	3.7	6.5
Meat Products	1.8	3.1	2.9	3.0	2.5	2.9	2.8	5.2
Pulp and Paper	4.4	2.4	3.6	2.5	2.8	0.3	2.4	3.1
Furniture (Durable)	2.3	1.7	4.3	2.3	2.1	0.2	1.6	4.0
Sheet Metal Products (Durable)	1.4	1.5	4.6	2.1	2.7	- 0.4	2.1	3.9
Domestic Clay Products (Durable)	0.3	1.4	7.0	2.0	4.3	- 1.3	3.7	5.0
Shipbuilding and Repairing (Durable)	1.1	1.4	5.3	1.9	3.2	0.1	2.6	4.5
Other Paper Products	2.1	1.2	4.4	1.8	3.6	0.5	3.0	4.3
Machinery Manufacturing (Durable)	3.1	0.5	4.3	1.6	3.3	- 0.6	2.2	3.3
Total Manufacturing	100.0	0.4	3.5	1.1	3.9	0.6	3.3	4.0
Total Durables Division	44.3	0.5	4.8	1.4	3.7	- 0.5	2.9	3.9
Total Non-durables Division	55.7	0.3	2.5	0.8	4.1	2.0	3.7	4.0

(1) For the 17 industrial groups the medion proportion of all manufacturing employees was.4.8 per cent and for the 32 key industrial the medion proportion was 1.5 per cent.

(2) Volume of output per manhour.

CHAPTER VII

RELATIVE PRODUCTIVITY AND THE TRENDS IN OUTPUT, PRODUCTIVITY AND EMPLOYMENT

Relative Productivity and the Trend in Output

In view of the well-known view that, other things remaining equal, growth will be the reward of the more highly productive, one might assume that the industries with the higher growth rates during the decade under review were those with the higher productivity at the beginning of the period. Unfortunately, the "other things" have a congenital trait of refusing to remain equal, and they exercised this faculty with abandon during the period under review. That is to say, contrary to the superficial views current in the land, relatively high productivity does not automatically provide a high growth rate, and low productivity does not automatically prevent a high growth rate.

Of the seventeen industrial groups, eight had productivity ranging from 6 per cent to 55 per cent above the average for manufacturing in 1949, and of these, four had growth trend rates equal to or higher than the average over the succeeding decade: Products of Petroleum and Coal, Chemicals and Allied Products, Non-metallic Mineral Products, and Electrical Apparatus and Supplies. On the other hand, four of the nine groups with relatively low productivity in 1949 had growth rates at or above the average to 1959: Tobacco and Tobacco Products, Foods and Beverages, Printing, Publishing and Allied industries, and Miscellaneous Manufacturing industries.

Turning to the thirty-two key industries, one finds that twelve had productivity ranging from 0.6 per cent to 115 per cent above average in 1949, and of these, four expanded output at trend rates at or above the average: Medicinal and Pharmaceutical Preparations, Bridge Building and Structural Steel, Synthetic Textiles and Silk, and Meat Products. But, of the twenty industries with relatively low productivity at the beginning of the period, eight established trend rates for output that were at or above the average to 1959: Other Paper Products, Shipbuilding and Repairing, Glass and Glass Products, Iron Castings, Domestic Clay Products, Aircraft and Parts, Prepared Fruits and Vegetables and Furniture.

If these comparisons are expressed as proportions, taking the number of groups or key industries with growth rates at or above average from 1949 to 1959 as a proportion of the groups or key industries with relatively high or low productivity in 1949, one finds that factors other than relative productivity play an important role in the determination of the industrial location of growth and in the allocation of resources.

Table 23

GROWTH GROUPS AND KEY INDUSTRIES AS PROPORTIONS OF TOTALS ABOVE OR BELOW AVERAGE PRODUCTIVITY

Relative Productivity in 1949	Number		Percentage with Output Trend Rates At or Above Average from 1949 to 1959	
Above or Below Average in 1949	Groups	Key Industries	Groups	Key Industries
Above Average	8	12	50	33
Below Average	9	20	44	40

Some of these additional factors may be cited briefly as examples. For the Products of Petroleum and Coal group, there was the discovery of oil in Alberta and the construction of the interprovincial oil pipeline to Ontario. The Chemicals and Allied Products group and the Medicinal and Pharmaceutical Preparations industry reflected new developments in medical research, the growing health-consciousness of an urban society, and the growth in synthetic and other industries dependent upon chemicals. The introduction of television and the growing uses for electronics contributed to growth in the Electrical Apparatus and Supplies group. The capital investment boom, of which the construction of the St. Lawrence Seaway may be taken as an example, pulled the Bridge Building and Structural Steel, and the Non metallic Mineral groups and the Glass and Glass Products and Domestic Clay Products industries into high rates of growth. Urbanization,the widespread use of refrigeration and the inconvenience of home preparation encouraged growth in the Meat Products industry. Defence procurement and other government contracts were the major factors behind the relatively high growth rates for the Aircraft and Parts and the Shipbuilding and Repairing industries, which, indeed, had relatively low productivity in 1949.

In addition, there is the fact that several groups and key industries with relatively high productivity in 1949 had trend rates for output below average from 1949 to 1959. The highest relative productivity was in the Non-ferrous Metal Smelting and Refining industry, with productivity 115 per cent above average, double the percentage rank of the Products of Petroleum and Coal group, yet its growth rate was below average from 1949 to 1959, owing to the weakness in export markets. Another export-oriented industry with a low growth rate, in fact one 25 per cent below average,was the Pulp and Paper industry, for which productivity had been almost exactly equal to that of the Products of Petroleum and Coal group in 1949.

In the Motor Vehicles industry, productivity, at 69 per cent above average, was second only to that for Non-ferrous Metal Smelting and Refining in 1949, yet its growth rate was more than 25 per cent below average through the decade.

The Agricultural Implements industry, which had the poorest output performance of all 49 groups and industries (-8.6 per cent per annum) had had a productivity level 19 per cent above average in 1949.

These facts have not been cited with the intention of minimizing the very great importance of increasing productivity, but rather to emphasize the fact that growth is the result of innumerable circumstances and forces, is largely the result of influences that are favourable to particular industries, has tended to occur in the relatively new industries, often proceeds despite the productivity status of the industry; and cannot be assumed a concomitant of relatively high productivity, except, perhaps, over quite long periods.

Relative Productivity and the Trend in Productivity

Among the seventeen groups, four of the eight with high productivity in 1949 had productivity trend rates above the average from 1949 to 1959, but high productivity trends also appeared in four of the nine groups that had had low productivity in 1949. Among the thirty-two key industries, only two of the twelve with high productivity in 1949 achieved a high productivity trend rate from 1949 to 1959 while eight of the twenty with low productivity in 1949 obtained a high productivity trend rate. Indeed,there were rather large changes in the relative degree of productivity for some groups and industries between 1949 and 1959. For

example, the productivity position of the Non-ferrous Smelting and Refining industry declined from 115 per cent above average in 1949 to 78 per cent above average in 1959; the position of the Agricultural Implements industry declined from 19 per cent above average at the beginning of the period to 37 per cent below average at the end of the period; the position of the Iron Castings industry, on the other hand, changed from 15 per cent below average to 22 per cent above average.

Relative Productivity and the Trend in Total Employment

Surprisingly, all eight groups with high productivity in 1949, incurred employment trend rates above the average from 1949 to 1959, as compared with only three of the nine that had low productivity in 1949. On the other hand, while six (or 50 per cent) of the twelve key industries that had high productivity in 1949 raised employment at trend rates at or above average from 1949 to 1959, nine (or 45 per cent) of the twenty with low productivity at the beginning of the period had high employment trend rates to 1959.

In the preceding section, it was found that the trend rate for employment depended upon the relationship between the trend rates for output and productivity, and that in every case where the employment trend rate was at or above average, the productivity trend rate was lower than the growth trend rate. At this point, one may note that the figures in the preceding paragraph indicate that this relationship tended to occur in the groups and industries that had a relatively high productivity in 1949.

Of the 49 groups and key industries under review, 26 had employment trend rates at or above the average in manufacturing from 1949 to 1959. Of these 26, only six had both growth and productivity trend rates above the average:(1) four were groups, all of which had high productivity in 1949, and two were industries, both of which had low productivity in 1949. In each case, the

(1) Those with growth rates above the average were the Products of Petroleum and Coal, Chemicals and Allied Products and Electrical Apparatus and Supplies groups, and the Non-metallic Mineral Products group with its components, the Domestic Clay Products and Glass and Glass Products industries.

productivity trend was lower than the growth trend. The six groups and industries for which these relationships held are listed in footnote (1) on the previous page. It will be noted that for each of these the high growth rate, as has been stated previously, was in large measure, the result of special circumstances or developments.

Of the remaining twenty groups and industries for which the employment trend rates were at or above the average for the period, only nine had growth trend rates above average, and all had productivity trend rates below the average in manufacturing. Among the seven groups in this category, four had relatively high productivity and three had relatively low productivity in 1949. Among the thirteen industries, six had relatively high productivity and seven had relatively low productivity in 1949.

Once more it must be concluded that a high trend rate for employment was not determined by a high productivity rate or a high level of productivity, but rather to an important extent by a high growth rate and particularly the degree by which the growth rate exceeded the productivity rate.

Table 24

RELATIVE PRODUCTIVITY, 1949 AND 1959, AND ANNUAL TREND RATES FOR PRODUCTIVITY, OUTPUT AND EMPLOYMENT, 1949-1959

A) Industrial Groups

	Percentage Deviation Above or Below Average Output Volume per Manhour in Manufacturing		Annual Trend Rates, 1949-1959		
	1949	1959	Productivity	Volume of Output	Employment
Products of Petroleum and Coal	55.3	138.7	7.9	9.3	1.6
Non-ferrous Metal Products	49.1	32.4	1.9	2.8	1.6
Chemicals and Allied Products	40.3	67.6	5.3	7.6	3.0
Paper Products	36.5	29.3	2.5	3.4	2.3
Iron and Steel Products	21.4	- 3.2	1.9	3.5	1.3
Non-metallic Mineral Products	13.8	23.4	4.4	8.5	4.5
Electrical Apparatus and Supplies	11.3	13.5	3.9	6.7	2.9
Transportation Equipment	6.2	- 2.3	1.7	2.5	1.3
Tobacco and Tobacco Products	- 1.9	41.9	7.5	6.9	- 0.1
Foods and Beverages	- 5.0	- 7.2	3.1	4.0	1.4
Printing, Publishing and Allied Industries	- 8.2	-18.5	2.3	4.0	1.9
Rubber Products	- 8.8	3.6	4.2	3.8	- 0.3
Textiles	-12.6	- 2.3	4.0	1.3	- 2.4
Miscellaneous Manufacturing Industries	-16.4	-20.3	2.4	5.6	3.4
Wood Products	-25.8	-27.9	3.2	2.9	- 0.1
Leather Products	-25.8	-36.5	3.5	2.6	- 1.0
Clothing	-28.9	-37.4	2.4	1.4	- 0.8
Total Manufacturing	-	-	3.3	4.0	1.1

Table 25

RELATIVE PRODUCTIVITY, 1949 AND 1959, AND ANNUAL TREND RATES FOR PRODUCTIVITY, OUTPUT AND EMPLOYMENT, 1949-1959

B) Key Industries

	Percentage Deviation Above or Below Average Output Volume per Manhour in Manufacturing		Annual Trend Rates, 1949-1959		
	1949	1959	Productivity	Volume of Output	Employment
Non-ferrous Metal Smelting and Refining	115.1	72.5	0.9	3.9	4.1
Motor Vehicles	69.2	71.6	3.1	2.9	0.3
Pulp and Paper	54.7	41.1	2.4	3.1	2.5
Medicinal and Pharmaceutical Preparations	27.0	64.9	7.0	7.6	0.8
Bridge Building and Structural Steel	27.0	-21.2	-0.3	7.6	8.2
Agricultural Implements	18.9	-37.4	-3.4	-8.6	-5.1
Primary Iron and Steel	18.9	27.9	3.1	3.7	1.3
Motor Vehicle Parts and Accessories	12.0	3.2	1.0	0.4	-0.3
Brass and Copper Products	10.1	0.5	2.3	1.1	-0.6
Synthetic Textiles and Silk	4.4	56.3	6.8	4.5	-1.9
Meat Products	1.9	- 4.1	2.8	5.2	3.0
Machinery Manufacturing	0.6	-12.2	2.2	3.3	1.6
Aluminum Products	- 5.0	-23.9	0.2	0.8	1.1
Other Paper Products	- 5.7	- 4.5	3.0	4.3	1.8
Sheet Metal Products	- 6.3	-18.5	2.1	3.9	2.1
Hardware, Tools and Cutlery	- 9.4	-25.7	1.0	1.4	0.8
Shipbuilding and Repairing	-11.3	-16.2	2.6	4.5	1.9
Glass and Glass Products	-12.6	-14.4	3.7	6.5	3.6
Iron Castings	-15.1	22.1	7.1	5.0	-1.2
Domestic Clay Products	-15.7	- 9.0	3.7	5.0	2.0
Cotton Goods (excluding clothing)	-18.9	27.9	2.6	-1.2	-3.7
Railroad and Rolling Stock Equipment	-21.4	-39.2	2.0	-3.2	-4.5
Aircraft and Parts	-22.0	-43.7	-0.6	10.4	12.1
Men's, Women's and Children's Clothing	-21.6	-33.8	1.9	1.0	-0.9
Saw and Planing Mills	-22.6	-20.7	3.9	2.9	-0.7
Prepared Fruits and Vegetables	-23.9	-14.4	4.2	5.2	1.0
Furniture	-27.0	-36.9	1.6	4.0	2.3
Woollen Goods (excluding clothing)	-30.2	-23.4	4.7	-2.0	-6.6
Knitting Mills	-34.0	30.6	5.0	2.6	-2.4
Leather Products	-38.4	-37.4	3.7	3.2	-0.5
Other Wood Products	-40.3	-52.3	1.0	-1.2	-1.8
Bread and Other Bakery Products	-45.9	-49.0	2.6	3.7	1.5
Total Manufacturing	-	-	3.3	4.0	1.1

Table 26

GROUPS AND KEY INDUSTRIES WITH ANNUAL TREND RATES IN EMPLOYMENT AT OR ABOVE THE AVERAGE IN MANUFACTURING, 1949-1959

	Percentage Deviation Above or Below Average Output Volume per Manhour in Manufacturing	Annual Trend Rates, 1949-1959		
		Employment	Volume of Output	Productivity
	1949			
Groups				
Non-metallic Mineral Products	13.8	4.5	8.5	4.4
Chemicals and Allied Products	40.3	3.0	7.6	5.3
Electrical Apparatus and Supplies	11.3	2.9	6.7	3.9
Paper Products	36.5	2.3	3.4	2.5
Products of Petroleum and Coal	55.3	1.6	9.3	7.9
Non-ferrous Metal Products	49.1	1.6	2.8	1.9
Iron and Steel Products	21.4	1.3	3.5	1.9
Transportation Equipment	6.2	1.3	2.5	1.7
- - - - - - -				
Miscellaneous Manufacturing Industries	-16.4	3.4	5.6	2.4
Printing, Publishing and Allied Industries	- 8.2	1.9	4.0	2.3
Foods and Beverages	- 5.0	1.4	4.0	3.1
Key Industries				
Bridge Building and Structural Steel	27.0	8.2	7.6	-0.3
Non-ferrous Metal Smelting and Refining	115.1	4.1	3.9	0.9
Meat Products	1.9	3.0	5.2	2.8
Pulp and Paper	54.7	2.5	3.1	2.4
Machinery Manufacturing	0.6	1.6	3.3	2.2
Primary Iron and Steel	18.9	1.3	3.7	3.1
- - - - - - -				
Aircraft and Parts	-22.0	12.1	10.4	-0.6
Glass and Glass Products	-12.6	3.6	6.5	3.7
Furniture	-27.0	2.3	4.0	1.6
Sheet Metal Products	- 6.3	2.1	3.9	2.1
Domestic Clay Products	-15.7	2.0	5.0	3.7
Shipbuilding and Repairing	-11.3	1.9	4.5	2.6
Other Paper Products	- 5.7	1.8	4.3	3.0
Bread and Other Bakery Products	-45.9	1.5	3.7	2.6
Aluminum Products	- 5.0	1.1	0.8	0.2
Total Manufacturing	-	1.1	4.0	3.3

CHAPTER VIII

EMPLOYMENT TRENDS IN GROUPS AND INDUSTRIES WITH WEAK OUTPUT TRENDS

The survey of trends in output, productivity and employment indicates that, of the 49 groups and key industries, there were 29 groups and industries with output trends below average or declining during the period 1949 to 1959, and that 18 of these had declining or low employment trends while the remaining 11 had employment trend rates that were at or above the average levels in manufacturing. If one compares these two categories of the weak output groups and industries, one finds that the main distinction between them is the different relationships between productivity and growth. In all 18 of the weak output groups and industries with weak employment trends, productivity rates exceeded output rates. In all 11 of the weak output groups and industries with stronger employment trends, productivity rates were lower than the output rates.

Weak Output Groups and Industries with Weak Employment Trends

Five groups and thirteen key industries were weak in terms of long-run growth and employment. All five groups had growth rates of less than 4 per cent. Eight of these thirteen key industries expanded output at trend rates of less than 4 per cent, and five had declining trend rates for output. All five groups and eleven of the thirteen industries had declining employment trend rates, and the two remaining industries increased employment at trend rates of 0.8 per cent and 0.3 per cent per annum.

Although the Rubber Products group had a declining trend rate for employment (-0.3 per cent), its growth rate (3.8 per cent) was only slightly below the average for all manufacturing (4.0 per cent). The declining trend in employment was the result of a high productivity trend (4.2 per cent) which was twenty-seven per cent above the average (3.3 per cent) for manufacturing. It is by no means certain that a higher growth rate would have provided a higher employment rate, for it may have been accompanied by a higher productivity rate. Aside from this point, the growth rate was restrained mainly

by two factors, the low growth rate in motor vehicles, and the growth in the re-tread and re-cap business. In view of these facts, it is difficult to conclude that Rubber Products is a problem industry, although its high productivity rate does contribute to the need for finding other sources of employment in the economy.

The Motor Vehicles industry, owing to the fact that it is an appendage of the United States industry, was caught in the upgrading trend that confined its market to higher and higher income groups, and this trend put the Motor Vehicle Parts and Accessories industry in a difficult position. The Industry in North America has taken steps to adjust to the market, a Royal Commission has reported, and public policy concerning the industry has been adjusted favourably for the industry.

Growth in the Wood Products group has been restrained by the low growth trend of the Saw and Planing Mills industry, which is export-oriented, and by the fact that output has been in a declining trend in the Other Wood Products industry, which is under pressure from substitute materials and the revolution in packaging. The export market for the Saw and Planing Mills industry has also been invaded by substitute materials. Although this industry has expanded output at a trend rate of 2.9 per cent, the high trend rate of productivity, 3.9 per cent, has resulted in a declining trend rate for employment of -0.7 per cent per annum. Since this industry contributed 6.9 per cent of total manufacturing employment in 1949,(1) the declining trend has aggravated the general problem of maintaining employment.

Growth in the Leather Products industry has been retarded by the introduction of substitute materials, particularly for personal accessories, and by technological changes in industry (e.g., decline in the relative importance of leather belts for machinery). A growth rate of 2.6 per cent plus a productivity trend rate of 3.5 per cent, has resulted in a declining trend rate of -1.0 per cent for employment. The Leather Boots and Shoes industry has expanded output in proportion to the growth of Canada's number of paid workers, at 3.2 per cent, but a productivity rate of 3.7 per cent has reduced employment in this industry at a trend rate of -0.5 per cent per annum.

(1) The Wood Products group provided 10.4 per cent of total manufacturing in 1949.

The Clothing group has expanded output at only 1.4 per cent per annum, and its productivity rate at 2.4 per cent has resulted in a trend rate of -0.8 per cent for employment. The group provided 10.0 per cent of total manufacturing employment in 1949. Growth has been particularly slow in the Men's, Women's and Children's Clothing industry, at only 1.0 per cent, but productivity has been nearly double that, at 1.9 per cent, thereby reducing employment at a rate of -0.7 per cent. The industry contributed 5.8 per cent of total manufacturing employment in 1949. Although Knitting Mills expanded output at 2.6 per cent, a productivity rate of 5.0 per cent reduced employment at a rate of -2.4 per cent annually.

The Textiles group had the most rapidly declining trend rate of employment, at -2.4 per cent per annum, for the high productivity rate (4.0 per cent) was more than treble the slow rate of growth (1.3 per cent). Furthermore, the group provided 6.6 per cent of all manufacturing employment in 1949. Woollen textiles were the hardest hit as employment declined at a rate of -6.6 per cent under the impact of a contraction of -2.0 per cent annually for output, combined with a rise in productivity at 4.7 per cent per annum. Contraction was not so severe in the cotton textiles industries (the trend rate for output was -1.2 per cent) and the productivity rate was not so high (2.6 per cent), but employment declined at an annual trend rate of -3.7 per cent.

The Hardware, Tools and Cutlery industry has been hampered by the relative decline and transformation in agriculture (saddlery and harness hardware, and scythes, for example), in forestry (adzes, axes, hand saws) and in stonecutting (stonecutters' hand tools), and by the competition of substitute materials that result in the product being manufactured in other industries (thermos bottles and vacuum jugs). Despite the low trend rate of growth (1.4 per cent), employment expanded at a rate of 0.8 per cent, owing to the low rates for productivity, which increased at an annual trend rate of only 1.0 per cent.

In the Brass and Copper Products industry, the productivity trend rate was over twice as high (2.3 per cent) as the growth trend rate (1.1 per cent) and employment declined at a trend rate of -0.6 per cent per annum.

The increasing competition from other materials, such as aluminum (tubes, pipes, wire screening), has restrained growth in this industry.

Of all the key industries that have been reviewed for this report, the two weakest have been the Railroad and Rolling Stock Equipment and the Agricultural Implements industries. The first has been the victim of a transformation in its market, the railway transport industry, and the second has been retarded, until recently by slowness to adapt to its changing market, by the relative decline in the agricultural sector, and by low replacement demand.

From the previous analysis and the present summary of the trends in manufacturing output, productivity and employment, two main points emerge. One is that the major source of difficulty for the weakened industries has been growth or transformation in other industries or in other sectors of the economy. A second is that productivity has continued to rise in the weakened groups and industries. In the above summary, it was shown that for all five groups and for all but one(1) of the thirteen key industries, the productivity trend rate rose faster (or declined less(2)) than that for volume of output. The result was the weak trend in employment.

Weak Output Groups and Key Industries with Stronger Employment Trends

In the remaining four groups and seven key industries with weak output trends, the trend rates for productivity were considerably less than their growth rates and lower than the average in manufacturing, and, with one exception (Aluminum Products) for which the employment trend rate was at the average level, all had employment trend rates higher than the average in manufacturing.

In this category one finds two groups and two industries that are export-oriented: the Paper Products and the Non-ferrous Metal Products groups and the Non- Metal Smelting and Refining and the Pulp and Paper industries. The Iron and Steel Products group was also in this category,

(1) The exception was the Hardware, Tools and Cutlery industry.
(2) In the case of Agricultural Implements, volume of output declined at a trend rate of -8.6 per cent but the trend rate for productivity was -3.4 per cent.

including the Sheet Metal Products, the Primary Iron and Steel and the Machinery Manufacturing industries.

In comparing these groups and industries with those in the first category (weak trends in both growth and employment) one finds that they tend to have higher trend rates for growth and lower trend rates for productivity, hence the above-average employment trends, although of course, both the output and the productivity trends were below the average in manufacturing.

Table 27

THE GROUPS AND KEY INDUSTRIES WITH BOTH GROWTH AND EMPLOYMENT TREND RATES BELOW AVERAGE, 1949-1959

	Proportion of Total Manufacturing Employment, 1949	Annual Trend Rates, 1949-1959		
		Volume of Output	Productivity	Employment
Groups				
Rubber Products	3.8	3.8	4.2	- 0.3
Wool Products (Durable)	2.9	2.9	3.2	- 0.1
Leather Products	2.6	2.6	3.5	- 1.0
Clothing	1.4	1.4	2.4	- 0.8
Textiles	1.3	1.3	4.0	- 2.4
Key Industries				
Leather Boots and Shoes	3.2	3.2	3.7	- 0.5
Saw and Planing Mills (Durable)	2.9	2.9	3.9	- 0.7
Motor Vehicles (Durable)	2.9	2.9	3.1	0.3
Knitting Mills	2.6	2.6	5.0	- 2.4
Hardware, Tools and Cutlery (Durable)	1.4	1.4	1.0	0.8
Brass and Copper Products (Durable)	1.1	1.1	2.3	- 0.6
Men's, Women's and Children's Clothing	1.0	1.0	1.9	- 0.7
Motor Vehicle Parts and Assessories (Durable)	0.4	0.4	1.0	- 0.3
Other Wood Products (Durable)	- 1.2	- 1.2	1.0	- 1.8
Cotton Goods (excl. clothing)	- 1.2	- 1.2	2.6	- 3.7
Woollen Goods (excl. clothing)	- 2.0	- 2.0	4.7	- 6.6
Railroad and Rolling Stock Equipment (Durable)	- 3.2	- 3.2	2.0	- 4.5
Agricultural Implements (Durable)	- 8.6	- 8.6	- 3.4	- 5.1

Table 28

GROUPS AND KEY INDUSTRIES WITH EMPLOYMENT TREND RATES AT OR ABOVE AVERAGE BUT WITH GROWTH RATES BELOW THE AVERAGE IN MANUFACTURING, 1949-1959

	Proportion of Total Manufacturing Employment, 1949	Annual Trend Rates, 1949-1959		
		Volume of Output	Productivity	Employment
Groups				
Iron and Steel Products (Durable)	14.0	3.5	1.9	1.3
Paper Products	6.5	3.4	2.5	2.3
Non-ferrous Metal Products (Durable)	3.8	2.8	1.9	1.6
Transportation Equipment (Durable)	8.9	2.5	1.7	1.3
Key Industries				
Non-ferrous Metal Smelting and Refining (Durable)	1.6	3.9	0.9	4.1
Sheet Metal Products (Durable)	1.4	3.9	2.1	2.1
Bread and Other Bakery Products	2.7	3.7	2.6	1.5
Primary Iron and Steel (Durable)	2.5	3.7	3.1	1.3
Machinery Manufacturing (Durable)	3.1	3.3	2.2	1.6
Pulp and Paper	4.4	3.1	2.4	2.5
Aluminum Products (Durable)	0.5	0.8	0.2	1.1
Total Manufacturing	100.0	4.0	3.3	1.1
Total Durables Division	44.3	3.9	2.9	1.4
Total Non-durables Division	55.7	4.0	3.7	0.8

SUMMARY

We have seen that the structure of the manufacturing sector has been altered by the differential rates of growth during the decade from 1949 to 1959. The groups and industries that increased in importance tended to be relatively small and were those that benefitted from petroleum discoveries in Canada, that were relatively new additions to the Canadian economy, that captured markets from traditional materials or products, that displaced imports, that obtained government defence orders, or that were directly affected by large forces such as the capital investment boom. We have also seen that changes in other industries, such as railroad transport, could precipitate a decline in supplying industries, or that a lag in adapting to changes in other sectors, such as agriculture, could retard an industry, or that innovations in other industries (such as synthetics) could weaken traditional industries, and that traditional industries are susceptible owing to their large stock of outmoded capital and to their hesitancy in departing from the paths of custom. It has been noted that an industry, such as Motor Vehicles, could be trapped in an upgrading trend.

These various factors made their influence felt at different times over the decade, but a concatenation of weakening factors following the Korean War gradually wore down the forces of expansion.

Productivity is not directly correlated with growth and average productivity was advanced sometimes by the weakening of less productive industries as well as by the higher rate of advance of newer and more capital intensive industries, and by the rising productivity in either declining industries or low-productivity industries.

Not only have the higher rates of growth and employment tended to appear in the smaller groups and industries, but high growth involved stationary or declining employment where productivity was high; low growth rates in several instances provided leading employment rates where productivity

was lagging, and expansion in employment occurred mainly in the administrative and office category.

It is clear that no single cause can be cited as the source of expansion in the 'fifties or as the source of deceleration after the Korean War, unless it is the presence or absence of war. Each industry has been affected by forces in its own supply or market environment and by its own history and condition.

A significant inference from this review of the trends in output, productivity and employment is that if the trend rate for productivity is to be increased before a satisfactory level of growth can be achieved, then the employment situation in manufacturing will tend to become more challenging before it improves.

The rate of employment will continue to depend, as it has in the past, on the rate of growth and the relationship between the growth rate and the productivity rate, and the unemployment problem will continue to be influenced by the type of demand for labour, or in other words, by the degree of trend from production workers to administrative and office employment.

The aggregate rate of employment will continue to depend, furthermore, on the industrial pattern of growth. If the larger industries continue their lethargic pace while high rates of growth tend to be confined to the newer, smaller and more capital-intensive industries, then what appears to be a satisfactory aggregate rate of growth will be accompanied by a low trend in employment.

The problem confronting those who are concerned to raise the trend rate for employment in manufacturing is that of obtaining a higher growth rate in the larger industries that have been oriented to the domestic market. If this problem is not resolved, even the newer industries that have been the major source of expansion will tend to decelerate, for once they have penetrated throughout the domestic market, they will depend upon the rate of expansion in the general economy, as well as their ability to develop new products.